Home Computing WEEKLY

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Tips on programming for VIC-20, and Oric

How you can write a 3D maze game

Use REMarks to store data with Spectrum and ZX81

Pages of news

BATTLE RAGES OVER FUTURE MICROS

TWO of the world's major software houses are locked in battle over home computers.

Both want to sign as many micro makers as possible to use their new standards — which could lead to software which will work on several computers as well as more programming features.

The two companies are Microsoft, with its MSX standard, and Digital Research, which has a combination of its CP/M opertating system — used mostly for business micros — and BASIC.

Already Microsoft says it has broad agreement from 14 Japanese micro makers and the first MSX adaptor would be available for Spectravideo computers by the end of the year with an MSX computer by early next year.

And more MSX computers are expected to follow shortly afterwards from Japanese companies.

As well as promising software compatibility, the MSX standard includes colour graphics and sound and even the positions of the ports.

It is based on the popular Z80A processor.

Digital Research, which has recently opened an office in Japan, already has CP/M, by far the most popular operating system for business micros, MBASIC and the newly-launched Personal BASIC.

Now it is marketing its eight-bit CP/M operating system to home computer makers.

How will the home micro user benefit? David Fraser, UK head of Microsoft, said: "They wouldn't see it — but how they would benefit is they would get more compatible and sophisticated software."

He said 14 Japanese companies had agreed to accept Microsoft's MSX, with the backing of the Japanese government.

And, in a comment which highlights the rivalry, he said: "Digital Research are just not popular in Japan — they have got no sizeable slice of the market there.

"I think one will become predominant, and that's MSX with the weight of the Japanese industry behind it. I would not like to try and stop it."

Digital Research sees it differently, of course. Its director of European operations, Paul Bailey, believes there may eventually be up to five compatible systems, including the Digital Research version.

He said: "It's a competitive market. But the biggest competition is from home-grown operating systems which has caused a lot of fragmentation."

Digital Research was determined to be competitive throughout the whole range of computers from large disc-based business

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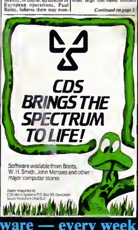

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Continued from front page

systems to inexpensive home models

Its standard could even offer built-in "expert systems" like home lawyer and home doctor as well as improved graphics and better facilities for spreadsheets and databases

Mr Bailey, who reckoned his company would have finished its development work in six months, said "It's going to be a lot more exciting You will be able to get a lot more done "

However, Gail Wellington Commodore's UK software manager, saw a distinct disadvantage — in standardising on one system development would be frozen

She believed it would be most useful for business computers where the demand was for more memory and speed, rather then colour, sound and special effects

She thought a standard could be offered to home users as a plug in option, or built-in and switchable

Tandy's customer services manager, Graham Richardson, said "I'd like to see it happen At the present time there is such confusion in the minds of the users.

"But would a buyer come back next week and buy his software from you, or will he go to the shop down the road? It can only do us good — we have never been particularly disturbed about other people selling software for our computers.

"And there would be an obvious advantage for software authors to sell their programs lots more people without having to convert "

Lots of storage for CBM micros

For VIC 20 and Commodore 64 owners who want a lot of storage, Automation and Power Systems has brought out a dual floppy disk unit which takes 3-inch floppy disks The disks store 125K in single density and 250K in double density format

The only drawback is that at £400 the unit costs quite a bit more than the computers

Automation & Power Systems, 6-8 Foredown Drive, Portslade, Brighton

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SOFTWARE SUPERMARKET

LATE NEWS

Micro group tells Minister. Act now

A four strong delegation from the Computer Trades Association met Trade Under Secretary John Butcher.

They discussed software piracy education and the 'unfair' import levy — six per cent on computers but 13 per cent on components — which makes it cheaper to manufacture abroad

After the meeting CTA general secretary Nigel Backhurst said 'We felt that we and the minister were thinking along the same lines The main problem is that the Government did not realise the urgency, that action has to be taken quickly.'

The CTA is taking legal advice over tapes which can copy commercial software, and believes there is a possibility of persuading the Director of Public Prosecutions to take criminal action for conspiracy.

GEC buys most of Torch

GEC, the giant industrial group, has bought a 76 per cent stake in Torch Computers from three company shareholders

Chairman Martin Vrieland Boddy and managing director Peter Harris who founded Torch two years ago, retain their 24 per cent holding

A Torch spokesman said the 'large sum of money' was needed for research, development and marketing, and that GEC believed it was a good opportunity to buy into a high technology company

The lowest priced Torch is £2 795 with 96K of RAM, and the company has just launched the Super Torch and 300 Series work station Each Torch incorporates a board from Acorn which is also used in the BBC micro

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ZX Spectrum HARDWARE
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Fighting dragons is all in a day's work for the men from Crash

Mail order with a human face

Crash Micro Games, a new software-by-post company recently set up in Ludlow, wants to see an end to faceless mail order.

According to Roger Kean, one of the three partners in Crash, "computer games represent a major new area of entertainment, but producers and distributors aren't treating it with the sort of showbiz zap found in the pop music industry. Yet in many ways the two are very similar.

"Games playing is enjoyable, but the choosing and purchasing of games should be just as much fun. Our customers should know who they are talking to and buying from."

Crash designs its own ads, which are intended to have the human rather than hi-tech touch, as well as its catalogue, which it describes as "an eight-page extravaganza".

Currently the company sells over 30 titles by post, all for the Spectrum. But it will be expanding into ZX81, BBC and Dragon software soon.

Send 50p, freepost, for a copy of the catalogue; you get the 50p back with your first order.

Crash Micro Games Action, Ludlow, Shrops SY8 1BR

From data to music — and back

Sanyo is the latest manufacturer to bring out a cassette recorder aimed specifically at home computer users.

But a useful feature of the DR101 lets you change from data to music mode at the flick of a switch. A third data mode allows you to hear the data as it's being loaded or recorded.

Other features are recording level indicator and tape counter with reset. The recorder will run off mains or battery, and sells for around £45.

Sanyo, 8 Greycaine Road, Greycaine Estate, Watford, Herts WD2 4QU

US software firm acts on rentals

A lawsuit currently in progress in the US over software rental could have important repercussions on the software industry in this country.

MicroPro, which makes business microcomputer software and produced the WordStar word processing program, has taken software rental company United Computer Corporation to court, claiming copyright infringement.

MicroPro wants UCC to pay damages of $10 million, and the four company principals to pay $1 million each.

The company "licenses" rather than sells its software to customers, on condition that the programs are not lent out or copied.

Last autumn MicroPro and Digital Research were jointly awarded $250,000 in a suit charging Dataforce International with illegal software copying.

MicroPro's General Counsel Eric Giardina expects the current case to encourage other US software companies to start proceedings against rental companies.

And David Butcher, director of MicroPro's UK division, warned that similar action might be taken against rental companies in this country.

Programs that mean business

Sharp has launched a range of business software for its MZ 80A micro.

There are six programs in the range: Directory, Price List, Sales Ledger, Purchase Ledger, Invoicing and Stock Control. They cost £19.95 each, including a user manual.

Each program can be used separately, but the range has been designed to work as a complete system too.

Sharp, Sharp House, Thorp Road, Manchester M10 9BE

You could be on our pages

We welcome programs articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (use a new ribbon) and/or sent on cassette. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

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Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE

WINDOW ON ANOTHER WORLD

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HCW 20

Salamander Software

Times are a-changing for software

The software industry is fast approaching maturity. A change is taking place from an amateur backroom industry to a professional big business. This is conclusively proved by the arrival of Virgin Games and Ultimate on the scene.

The change can only be good for the customer. Quality, especially in games, is rising sharply, caused by increasing competition and more critical reviews in magazines. It will be hard to beat the quality of games like Ultimate's Jet Pac for the Spectrum.

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All this has meant greater pressure on programmers to be constantly bettering their creations. A thoroughly professional attitude now has to be taken with each new game.

More and more frequently, teams of people are involved in producing a program. Artists to design the graphics, specialists to advise on sound effects, and often offensive critical testers.

Programmers not only need to know how to write code, but must be good all-rounders too. They must have a talent for drawing, a reasonable understanding of music and sound effects, and greater than-average knowledge of hardware.

A lot of software houses are now moving over from freelance programmers to full-time, in-house programmers, who can make the most of time and expertise without running up a huge phone bill. The days of the schoolboy programmer who earns more than his father are numbered: the public just won't tolerate amateurs any more.

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Over the next few years, I foresee the software houses becoming the record labels and the programmers the equivalent of pop stars. This is a tried and tested technique which has worked for films and records, and will work again.

On the subject of marketing, a more honest attitude to advertising is bound to develop soon because of the disillusionment with companies who spend more on hyped-up advertising than they do developing their programs. No-one wants to pay £5 or £6 for a fancy cassette insert covering a game which is a mere apology for what was advertised.

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There has been a lot of discussion in HCW's columns on the subject of software pricing. I don't think the general public appreciates the cost of launching a software cassette. No-one can predict whether a game will be a roaring success or a pitiful flop, and you've got to cover yourself against copying too.

Not until bankruptcies start occurring among the amateurs who only put people off buying further cassettes will prices start to drop to a more reasonable £3.50 or £4 — but they'll never go as low as £1.50.

As one who knows the software business from the inside, I'd say that the public should be careful when spending their money, and always look at a selection of programs before buying. If you think a program's too expensive, don't buy it! Sales or the lack of them are the only thing that will guarantee a better situation for both consumer and software company.

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David J. Anderson
Spectrum programmer for Silversoft and Romik, Saltcoats, Ayrshire

Software writers — it's your agent

If you've written a program you think might make the big time, you may be interested to hear that Neil Gibson & Co will act as an agent for software writers.

John Courage, a marketing consultant who set up the venture, explained: "In publishing or music, writers take their work to agents who negotiate the best deals for them. Software is the only industry I know of where this doesn't happen as a matter of course. Writers have to try and fend for themselves."

He first got interested in the software market after hearing about an offer a software company had made to two of his son's friends. He said: "I was frankly appalled at the terms of the offer.

"I advised them to have nothing to do with it, and within three weeks I managed to get them an offer at four times the previous amount, and on much more straightforward terms."

Mr Courage set up his venture six months ago, after researching the market for a year. As part of his research, he says, he looked at all the commercially available software for the Sinclair micros.

"My assistants and I now have cupboards full of cassettes," he said. "It hasn't gone down very well with our wives."

Like any other kind of agent, Neil Gibson doesn't ask programmers for any money until they've actually been paid for a program. Programs that are sent in but considered unsuitable are simply returned.

If the company thinks a program does have potential, it will advise on how it could be improved and, in some cases, provide a complete marketing service, including packaging and a sales representative.

To assess programs, Neil Gibson uses the services of a paid user panel, who play the games and say what they like and dislike about them.

In the six months the venture has been underway, Mr Courage says they have been sent about 200 programs, of which half have had to be rejected. A quarter are being improved, and a quarter have been placed with software companies.

If it succeeds in selling a program to a company, Neil Gibson takes from six to 25 per cent of the proceeds, depending on how much work has gone into the deal.

"But we have to accept the same terms as the programmer", Mr Courage said. "If they're paid a percentage of sales, then we have to wait for our percentage.

"In some cases a percentage will be a better deal than a flat fee, and we're bound by the terms of our contract to seek the best possible deal for the programmer.

"And if by any chance we spend more on promoting a program than we get back, we don't ask the programmer to make the loss good."

Mr Courage said he expected the venture to start making a profit in two years' time. "We believe it's a market with a good long-term future, and we're prepared to wait."

Neil Gibson & Co, 42 Abbeygate Street, Bury St Edmunds, Suffolk

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is a new adventure game for young people. YOU are a pirate, and it's your job to explore an unchartered ocean. Simple function key presses (no spelling required) ensure easy sailing around the New World. What will you find? Treasure trove? Savage islanders? One of HM Ships out to get you? THERE has NEVER been a BBC 'B' game like it! Two full-colour and sound programs for £9.25 (all inclusive)

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Going for the record

Anco Software is hoping to push down the price of programs — by releasing them on 7 in records instead of cassettes.

Anco's proprietor Philip Sands said: "I heard that someone had released a music single with a program on the back and thought, why don't I give it a try?

"I rang round a few record producers to get estimates and found a company that's given me a really good deal — it's going to cost half of the price of producing a cassette."

Mr Sands aims to appeal mainly to young computer games players buying software out of their pocket money. "At present", he said, "the only way for them to buy games is to save for a few weeks, or bribe one of their parents to buy it for them."

The first programs Anco is releasing on record are for the Spectrum. There is a 10-games pack and a new game, Sam Slug, which will both run on the 16K machine, and a 48K version of Defender. Each game will cost £2.25 inc postage and packing.

The games can be loaded directly from a record player into the Spectrum via the headphone socket, but Anco recommends that a cassette backup copy is made in case the record gets scratched.

Philip Sands wants to drop the price of the software records still further if the idea catches on. Meanwhile, he will be continuing to supply Anco software on cassette.

Anco Software, 25 Corsewall Street, Coatbridge

Win a prize with your Spectrum

If you're a Spectrum owner living in the Portsmouth area, tune into Radio Victory this Saturdsy for a competition designed with your micro in mind.

The competition is in the form of a program written for Radio Victory by Portsmouth-based software company Automata.

Load the program into your Spectrum — either direct from the radio or from a tape recording — run it, and you'll find a couple of lines that might seem familiar.

If you think you know where they come from, write in to Radio Victory's DJ Dave Carson, and you could be among the lucky prize winners.

The idea for the competition came from Radio Victory, but Automata is no stranger to radio. As well as software, the company specialises in "all-round entertainment", according to director Christian Penfold.

It has worked with Radio Victory before, producing a 20-week quiz series which Christian said was "rather like University Challenge without the brains".

The Spectrum competitioo will be broadcast every Saturday for the next three weeks between 1 and 2 pm. As well as Portsmouth, readers in Southampton, Petersfield, Arundel, Solent, the Isle of Wight and Gosport should be able to hear the broadcast.

Prize-winner Francis Ho (left) and Audiogenic's Susan Allan and David Smithson

Francis gets our top prize

Francis Ho got the top treatment when he came to our offices last week.

He was first prize winner in a competition in the ninth issue of Home Computing Weekly.

And the presentation was made in the boardroom by David Smithson, product manager of the sponsors of the competition, Audiogenic.

In the competition readers were asked to find Audiogenic software titles — among a list provided — hidden in a word square.

Francis, a trainee chartered accountant, aged 22, found them all. His share of the £1,000 worth of prizes was Audiogenic's Wordcraft 20 word processor cartridge for the VIC 20 plus £150-worth of software from Audiogenic's catalogue. Total value of his prizes: £300.

He was also given a preview of some of the new software due out soon. At the presentation to Francis were Paul Liptrot, of Home Computing Weekly, Mr Smithson and Susan Allan, of Audiogenic, and Jeremy Bigg and Fran McMillan, of Audiogenic's public relations consultants.

From books to software

Another sign of the shape of things to come in the software market: paperback book distributors Websters Group has announced that it's moving into software.

The arrival of large companies like Websters, which come on to the software scene ready armed with experience of marketing and promotion in other fields, is just part of the steady professionalisation of home computer software.

Clive Digby Jones, who is in charge of the Websters Software operation, said: "We'll be selling into retailers, who won't by any means be just computer shops, on the basis of servive and marketing support.

"Instead of having to deal with dozens of different suppliers, the retailer will be able to obtain all the worthwhile titles for some 15 different computers from just one source."

Websters plans to start off with 400 programs, mainly games but also some educational and small business software. This list is expected to quickly double in size as new titles come out — but Websters says it will select titles first to make sure they are good quality.

Marketing manager Jenny Trus said: "We want Websters Software to be associated with titles that work and are good value for money.

"Any retailer who deals with us is not just buying consignments of software, but an entire package including product evaluation, testing and marketing support."

Websters Software, Langham Park, Catteshall Lane, Godalming, Surrey GU17 1NG

Games with a longer life

People deserve more than run of the mill Space Invader games — that's what Jabberwocky Software thinks.

Its first program, From Russia With Luck, took Jabberwocky's Jean Frost eight months to write. The game is an adventure based on real-life information: its database includes information from Thomas Cook's timetables and the ABC World Airways Guide.

The aim of the game is to travel from Russia to Italy, trying to out shoot and out-manoeuvre the KGB as you go.

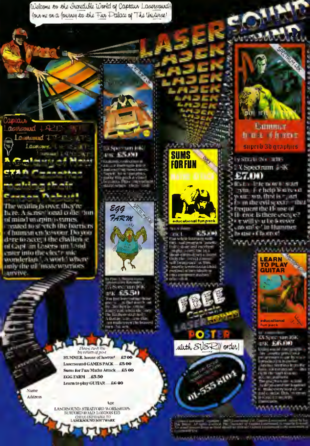
According to Chris Smith of Jabberwocky, "it has arcade action, but you need to use skill and judgement too".

Jabberwocky's next offering will be Epic, "an adventure game with a difference" for the BBC micro.

Another game is "waiting for clearance from a higher authority", according to Chris Smith. "It's something to do with the RAF", he said.

But he emphasised, "we won't be rushing games on to the market. We believe in quality games, and those take time to write."

Jabberwocky Software, 610 Washwood Heath Road, Birmingham B8 2HG



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Earth, snakes and fire

You can battle against the elements (well, some of them) in these Spectrum games, rated for you by our review panel

Monsters in Hell £5.95

Softek, 329 Croxted Road,
London SE24

Hell's flames flicker at the foot of the screen, whilst above, various floors are linked with ladders

Equipped only with a hammer, you set out to break holes in the floors and consign the monster chasers to the flames.

But the monsters are only your first problem After 25 of them, the Mad Monk sends Ghouls, and after 10 of them he sends clones of himself After 65 kills he send his Demons and you certainly won't survive them (After all, this is supposed to be Hell!)

You do have a certain amount of help in the form of Holy Power, which is renewable at the sign of the cross, and nine lives

I have to admit that I didn't get beyond the initial Vampire Monsters I wanted to face the clones and so on, but I just wasn't fast enough, and hereby lies my biggest grouse Why no variable speed setting?

D M

instructions	90%
playability	90%
graphics	95%
value for money	95%

★ ★ ★ ★

Gold Mine £4.95

dk'tronics, Unit 2, Shire Hill
Industrial Estate, Saffron
Walden, Essex

Starting at the pithead of a gold mine, you must ascend and descend the mineshaft and dig for gold in the hope of striking it rich

Barring the way to wealth are hard rock, streams, rock falls, or simply fatigue Go too far and you won't be able to get back, collect too much gold and you'll be too heavy for the hoist to lift you

If you manage to get your booty back to the mine buildings, you can re-equip and start out again — by handing some of the gold over

Reasonable but not spectacular graphics — I like the way the miner puts up pit props as he proceeds

There are four levels of difficulty, and a nice touch is that you can define your own keys There's an introduction to the game on one side of the tape, with the game on the reverse

P.F.

instructions	90%
playability	75%
graphics	75%
value for money	75%

★ ★ ★

Magic Mountain 48K £4.95

Phipps Associates, 99 East
Street, Epsom, Surrey KT17
1EA

This adventure, when loaded, gave the distinct impression that I had seen it before In fact, the instructions could have been interchanged with the other Phipps adventure, Pharaohs Tomb

But the pictures of the locations were different and the room layout was different, giving at least some variation

The game was still slow, however, the problems were no more difficult and I found little adventure in the way of things to fight

This would probably be more of a game for those who are not too deeply into adventure gaming and would like to be broken in gently

N B

instructions	90%
playability	65%
graphics	90%
value for money	80%

★ ★ ★

Snake Pit £7.99

Postern, PO Box 2, Andoversford, Cheltenham, Glos
GL54 5SW

The action of this game is similar to the Pacman in that you gobble up various objects to gain points, and that's where the similarity ends

If you have a version of wriggling, squirming things than go and play something else, this is not for you! For the objects your friendly little characters is eating are snake eggs, and waiting in little nests for the eggs to be eaten are snakes

As soon as the eggs bounding the nest are eaten the snakes are free to wriggle their way realistically round the screen after your little friend On the snakes' side is Red snake, which eats up eggs as well

If you can survive the first round without being eaten then you can get your revenge by eating the snakes' Altogether a fascinating and addictive game, if you don't mind snakes

G G

instructions	90%
playability	100%
graphics	95%
value for money	75%

★ ★ ★ ★

Firebirds £5.95

Softek, 329 Croxted Road,
London SE24

For once I agree with the description of the game on the inlay, a fast moving, super smooth high resolution shoot-em-up game

Waves of Firebirds swoop and dance in formation while continually dropping bombs As if this isn't enough, along come the Blue Weavers with their beams of destruction, followed by the White Bombers I'm not sure about these White Bombers, because they didn't drop any bombs, but you have to continually dodge them Finally, along comes the mothership

The graphics animation is very good, and the game is very playable, though I didn't find it addictive.

G B

instructions	100%
playability	95%
graphics	95%
value for money	100%

★ ★ ★ ★

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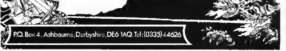

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BBC PROGRAM

On your bike . . . with a joystick for handlebars

Race around the screen with Shingo Sugiura's program for the BBC model B micro, plus a pair of cheap joysticks. Shingo got the idea from the Disney film, Tron

Walt Disney's graphically stunning film Tron gave me the idea for this game, which needs a BBC micro with joysticks

As the cycles have to be controlled up, down, left and right imagine playing on the keyboard You can use inexpensive joysticks plugged into the analogue to digital converter at the back of the micro.

After running you will be greeted by a short instruction and after that the game begins and you choose sides

Make sure you and your opponent have the sticks pushed forward as the cycles will start from the bottom of the screen The rules are as in the film — you have to avoid hitting the trail or going off the games grid

There is a clock in the top left hand corner of the screen so you can either try to kill each other as quickly as you can or you can try to survive as long as you can Press the space bar for another game

If you have not got a 1.2 operating system you must not type in lines 160 to 250 They redefine the numbers and will crash machines without O.S.1.2

How it works

10 instructions
20 selects model
30-120 main routine
130-360 initialise variables, define characters
390-470 set up games grid
480-540 check joystick 1
550-610 check joystick 2
620-690 draw trail
660-690 draw other trail
700-730 death routines
760-870 instructions

```
10 MODE7 PROCinstructions
20 MODE1
30 REPEAT
40 PROCinit PROCscreen TIME=0
50 REPEAT
60 PRINTTAB [illegible] );TIME 10
70 PROCjoystick1
80 PROCjoystick2
90 PROCdraw1 PROCdraw2
100 UNTIL death1=TRUE OR death2=TRUE
110 PROCdeath
120 UNTIL FALSE
121
130 DEFPROCinit
140 VDU28 19,3 4 0,23 10 [illegible] 0 0,0,16 16 [illegible] 17 1
141
150 REM *** Delete lines 160 to 250 for OS 0.1 ***
151
160 VDU23 48 &FE,&82,&82 &E2,&E2 &E2 &FE &00
170 VDU23 49 &38 &08 &08 &38 &38 &38 &38,&00
180 VDU23 50 &FE,&02,&02 &FE &E0 &E0 &FE,&00
190 VDU23 51 &FE,&02,&02 &FE &0E &0E &FE &00
200 VDU23 52 &80 &80 &C4 &C4 &FE &1C &1C &00
210 VDU23 53 &FE &C0 &C0 &FE &0E,&0E &FE,&00
220 VDU23 54 &F8 &80 &80,&FE &E2 &E2,&FE &00
230 VDU23 55 &FE &02 &04 &18 &38,&38 &38 &00
240 VDU23 56 &7C &44 &44 &FE &E2 &E2,&FE &00
250 VDU23 57 &FE &82,&82 &FE &0E,&0E &FE,&00
260 VDU23 231 &FE &C6 &C6 &E6 &E6 &E6 &E6,&00
270 VDU23 230 &FE &C6 &C6 &E6 &E6 &E6,&FE &00
280 VDU23 229,&FC &C4 &C4 &FE &E2 &E2 &E2 &00
290 VDU23 229 &F8 &C8 &C8 &FC &E2 &E2 &E2 &08
300 VDU23 228 &FC &C0 &C0 &FC &E0 &E0 &FE,&08
310 VDU23 226 &FC &C0,&C0 &FC &E0 &E0 &FC &00
320 [illegible] &C8 &78 &E8 &E8 [illegible]
```

Hints on conversion

This program uses the PROCedures to full effect In fact there isn't a single GOTO or GOSUB in the whole of the program, so it is well structured and readable. Therefore it should not be to difficult to convert it to run on other machines that have high resolution graphics.

MODE1 has a resolution of 320 by 256 of four colours but in fact the screen is 1280 by 1024.

VDU23,a,b,c,d,e,f,g,h Defines a character of 8×8

PROC should be replaced with GOSUB.

REPEAT ..UNTIL loops should be replaced with GOTO

Numbers with & are in Hexadecimal. On the Beeb TRUE has the value of -1 and FALSE has the value of 0.

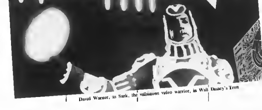
POINT(X,Y) returns the colour of the co-ordinate (X,Y).

CHR$141....double height.

ADVAL checks the analogue of digital converter

If you do not have joysticks it should be very simple converting the program to scan the keyboard instead of the joysticks, but the game would be extremely difficult to play and the whole point of the program in the first place was to use the joysticks!

Although in the manual it



copyright Walt Disney

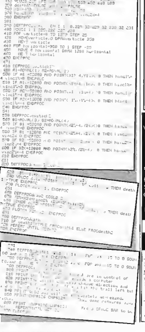
David Warner, as Sark, the villainous video warrior, in Walt Disney's Tron

▶

BBC PROGRAM

says that you have to reset PAGE if you redefine characters in ROM the program seems to work fine without doing so (at least it does on my machine).

I think that the joystick can be used to great effect on games such as Missile Command, Centipede or, perhaps, Tempest. If Acorn is reading this article, please distribute Missile Base to the dealers because all the dealers I've been to tell me that they can not get their hands on any. Same for Snooker and Star Ship Command. They look brilliant but I and many other Beeb users simply cannot get any.



```
[illegible]
310 VDU23 [illegible] 250 400 438 600
350 death1 FALSE [illegible] FALSE
360 X1=400 [illegible]
370 hinc1 [illegible] vinc2%=4
380 ENDPROC
381
390 DEFPROC[illegible] 0,228 32 429 32 230 32 231
400 VDU31 [illegible] 320,228 32 428
410 FOR verticle=0 TO 1279 STEP 25
420   MOVEverticle,0 DRAWverticle 950
430   NEXT verticle
440 FOR horizontal=950 TO 1 STEP -25
450   MOVE 0 horizontal DRAW 1280 horizontal
460   NEXT horizontal
470 ENDPROC
471
480 DEFPROCjoystick1
490 A1=ADVAL(1) A2=ADVAL(2)
500 IF A1>=52000 AND POINT(X1%-4,Y1%)<>0 THEN hinc1%=
-4 vinc1%=0 ENDPROC
510 IF A1<=12000 AND POINT(X1%+4,Y1%)<>0 THEN hinc1%=
4 vinc1%=0 ENDPROC
520 IF A2>=52000 AND POINT(X1%,Y1%+4)<>0 THEN hinc1%=
0 vinc1%=4 ENDPROC
530 IF A2<=12000 AND POINT(X1%,Y1%-4)<>0 THEN hinc1%=
0 vinc1%=-4 ENDPROC
540 ENDPROC
541
550 DEFPROCjoystick2
560 B1=ADVAL(3) B2=ADVAL(4)
570 IF B1>=52000 AND POINT(X2%-4,Y2%)<>0 THEN hinc2%=
-4 vinc2%=0 ENDPROC
580 IF B1<=12000 AND POINT(X2%+4,Y2%)<>0 THEN hinc2%=
4 vinc2%=0 ENDPROC
590 IF B2>=52000 AND POINT(X2%,Y2%+4)<>0 THEN hinc2%=
0 vinc2%=4 ENDPROC
600 IF B2<=12000 AND POINT(X2%,Y2%-4)<>0 THEN hinc2%=
0 vinc2%=-4 ENDPROC
610 ENDPROC
611
620 DEFPROC[illegible]
630 [illegible]
640 VDU2 [illegible] POINT [illegible] IF [illegible] THEN death
1=TRUE ENDPROC
650 PLOT[illegible] ENDPROC
651
660 DEFPROC[illegible] GCOL0 2
670 Y2%=Y2%+vinc2% [illegible]
680 VDU2 [illegible] POINT [illegible] THEN death
2%=TRUE ENDPROC
690 PLOT[illegible] ENDPROC
691
700 DEFPROCdeath
710 IF death1=TRUE PROC[illegible] ELSE PROCdeath2
720 REPEAT UNTIL [illegible]
730 ENDPROC
731
740 DEFPROC[illegible] FOR [illegible] 15 TO 0 SOUN
D0,amp [illegible] ENDPROC
750 DEFPROC[illegible] FOR amp[illegible]15 TO 0 SOUN
D0,amp [illegible] ENDPROC
760 DEFPROC[illegible]
800 PRINT [illegible]
810 PRINT [illegible] are in control of
820 PRINT [illegible] a computer
830 PRINT [illegible] change direction and
[illegible] the trail left be
840 PRINT [illegible] you will [illegible]
850 PRINT CHR$126 CHR$12[illegible] joysticks are needed.
[illegible] The game requires [illegible]
860 PRINT [illegible] CHR$126 CHR$131 [illegible] Press SPACE BAR to be
gin [illegible] REPEAT UNTIL GET [illegible]
870 CLS [illegible]
```

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Spectrum's key illusion

Have you ever noticed the full size photograph of the Spectrum on the front page of Sinclair's ads? If you look carefully at the keypad in the photograph, you will notice that the keys seem to be covered in shiny hard plastic, whereas on the second page of the ad the keys appear as their normal rubbery selves.

Taking a closer look at the photo on the first page, you can see that the picture has been heavily touched up. I believe this to be breaking the Sale of Goods Act 1979. I quote "Where goods are sold by description, there is an implied condition that the goods will correspond with the description" (Section 13).

If a photo isn't a description, what is?

W. J. Bailey, Hatfield, Herts

Bill Nicholls, for Sinclair Research, said: "All that has been retouched in that photo is the red keywords on the keys, which don't reproduce well photographically — but that's just because we thought people would want to be able to read them. Apart from that, there's been no hocus pocus with the keyboard. Having had a few brushes with the Advertising Standards Authority lately, we're being super-careful now."

Rallying round

Recently I bought a copy of your magazine (June 14-22) and typed in the rally program for the VIC-20. The game would not run properly until the following changes were made:

```
30 PRINT"(Home,Cd,Cl,
   Del+SHIFT)" rest of line
   same
90 IF PEEK(1)=160 OR PEEK
   (1) THEN1160
```

Apart from this, the game ran well. I hope that your magazine will stay as good as it is. Good luck for the future.

Simon Fowler, Romford, Essex

Can you take the PAICC(sic)?

Forsaken by Prestel and desperately short of dealers, the Penwith area of Cornwall now has an up and running computer club.

PAICC (Penwith Area Independent Computer Club) hopes to change all that neglect. The Club is non-profit making, non-aligned, and aimed at both the professional and amateur user. Its goal to promote computer literacy in the area and to stimulate the use of computers in local education.

The PAICC Founding Committee includes a representative for women, for local industry, for education, for business applications, for home users and for under 18s.

The Club is at present meeting every Friday in a well-equipped room above the Penzance Micro Centre, which has allowed the club access to some of their equipment and use of a part of their premises.

PAICC is fully affiliated to the ACC and prospective members should phone one of the following, Steven Ericsson Zenith on Hayle 754845, Paul Whitehead on Penzance 66336 or Miss Millage on Sennen 500.

Steven Ericsson Zenith, Hayle, Cornwall

Anyone for an Oric club?

Does anyone in West Lothian, Scotland, own an Oric? I am toying with the idea of starting an Oric club for the area, with a view to organising meetings for swapping tips etc.

I've got a few ideas of my own as to how a club should be run, but I'm open to suggestions. If you are interested in starting/joining a group of users in the West Lothian area, ring me on Whitburn 42673.

Stuart Wilson, Whitburn, West Lothian

Where's my game?

Due to the recession I took early retirement. Thinking that computing would help to pass the time, I bought an Atari 400 and, being on limited means, looked around for some cheap games.

I saw an ad for Cascade Software's 50 Games for £9.95, and sent off my postal orders 13 weeks ago. Seven weeks later, they sent me a letter promising delivery within 14 days, and since then, nothing!

I have written asking for either the tape or a refund, but have had no reply. What's going on?

R. Davies, Bolton, Lancs

Mr Stevens, of Cascade, said: "We had some quality control problems with the 50 Games tape, and a lot of the early tapes we sent out were returned. Now we're frantically trying to get a batch that's up to standard, and when we do they'll be despatched as soon as possible."

Oric critic unrepentant

I think I must write to defend myself from C. Black and Mark Phillips (issues 14 and 15). They both write to criticise my letter, but my letter was after all based on my own experiences with the Oric.

Having recommended the Oric to a friend, I felt guilty when he finally had to take it back, and surprised that I had been so wrong in assessing its potential. I really feel that on the basis of both the adverts and reviews that it was cracked up to be better than sliced bread.

I suppose I failed to emphasise in my first letter that the Oric's reviewers on the whole failed to do their usually very good job. For once they all said that they had review models that weren't working properly. How could they review a machine that wasn't fully operational?

Now a few specific points. As Mark Phillips says, the Oric does indeed have syntax checking — once you have entered the whole program and run it. Most larger micros work like this, I know, but is it really a good idea in a machine aimed at the beginner?

C. Black from Glasgow only seems to have had contact with the Oric, so I don't see how he can be aware of the possible sound effects on the Spectrum. Admittedly it is easier to produce good sound on the Oric, but as it was designed as a successor, with three sound channels, it certainly should be.

To paraphrase Mr Black, one final point: you may get what you pay for, but price is subjective. The 48K Orics and Spectrum were both originally priced the same, and it's only good business practice to undercut your opponent if you can.

John Shiall, London N4

Mr. Chip
SOFTWARE

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BUGSY (Joystick Only) £5.50

This is a Minefield with a difference as you step on the stones whilst collecting purple boxes which give you both time and points, they disappear from beneath your feet DO NOT DESPAIR! 'BUGSBY' will randomly replace the stones but avoid bumping into him or its sudden death! An original compulsive and challenging game

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This is it, the ultimate Fruit Machine Program, for the VIC. You will be truely amazed by the Graphics, Colours and nine different tunes & sound effects of this remarkable Program. With nudge, hold & respin, can you win the JACKPOT 100% Machine Code £5 50

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All the fun of the fair

Recreate the thrill and skill of the shooting gallery with Jack Knight's game for the Spectrum

The scene is a fairground booth, with a gaily striped awning at the top and a red counter with Shooting Gallery emblazoned on it in gold. Inside, nine light-coloured balls are bobbing up and down on air jets — and the game is to shoot them off.

On the counter is your rifle sight, which can be moved under the air nozzle of any ball. The pointer can be moved on she sight to represent the position to be fired at. You're got 10 shots for your money, so take aim and fire. Sounds easy? Try it!

You aim using the cursor keys, and use zero to fire. A counter displays the score and high score. If you want another game, just clear the screen, and a new game should start almost immediately.

My main problem is designing this game was how to stop a ball, once destroyed, from reappearing. This was overcome by using DIM, and changing the appropriately numbered string in the PRINT statement from a ball graphic to nil.

The only user-defined graphics used are for the balls and one of the five parts of the main sight. I've converted the binary numbers to decimal to save the tedium of BINing. The balls are GRAPHICS + A, the parts of the rifle sight, + B

Hints on conversion

There should be no problems in conversion after a study of the documentation and the listing

Variables

- a,b,c line positions of the balls (3 to a variable)
- aa,bb,cc allow for a, b, c to be + or − 1
- e column position of rifle sight
- g line position of pointer
- DIM q identifies the individual ball (for removal from game)
- s score
- j shots
- k,l,m store previous ball positions for the blotting-out
- d random reversal of balls
- i avoids a series of e+1 s
- n,p,q control variables

How it works

REM statements clearly identify the component parts

100-220 continuously print (and blot-out) the balls, reverse their direction at top and bottom and where specified by RND, use INKEY$ to jump to subroutines

400-470 count number of shots and if 10 exceeded jump program to end; check by ATTR whether a character space fired at is empty, if not there must be a ball there, so reduce the ball string to nil, increase the score and if the maximum of 45 jump to end routine

700-830 set the scene, make provision for score and high score

1000-1800 assign variables

1900-1920 print the rifle sight and pointer in a subroutine to avoid reprinting each time the main loop is gone through

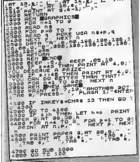
2000-2600 create the graphics assigning the ball to A and the part of the rifle sight to B

3000-3300 at game end print comment on the score

4000-4800 offer a new game and if accepted deal with high score, clear the screen as necessary, take the program through the variables and the sight and pointer reprinting to the main loop

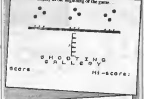
```
  10 REM ■AIR UP!■BY JACK KNIGHT

  20 LET h=0
  30 GO SUB 2000
  40 GO SUB 700
  60 REM ■MAIN LOOP■
 100 PRINT AT k,6;" ";AT a,14;"
";AT k,23;" ";AT l,7;" ";AT l,16
;" ";AT l,24;" ";AT a,8;" ";AT m
,16;" ";AT a,22;"
 110 PRINT INK 6;AT a,6;q$(1);AT
a,14;q$(4);AT a,23;q$(8);AT b,7
;q$(12);AT b,15;q$(5);AT b,24;q$(
9);AT c,6;q$(3);AT c,18;q$(6);AT
 c,22;q$(7)
 120 IF INKEY$="7" AND g>=13 THE
N PRINT AT g,e;" ": LET g=g-1: G
O SUB 1910
 130 IF INKEY$="6" AND g<=16 THE
N PRINT AT g,e;" ": LET g=g+1: G
O SUB 1910
 140 IF INKEY$="8" AND e<=22 THE
N LET e=e+1: GO SUB 1900
 145 IF INKEY$="5" AND e>=6 THEN
 LET e=e-1: GO SUB 1900
 150 LET k=a: LET l=b: LET m=c
 160 LET d=INT (RND*3+8)
 170 IF a=4 OR a=6 OR a=d THEN L
ET aa=-aa
 160 IF b=4 OR b=6 OR b=d-1 THEN
 LET bb=-bb
 180 IF c=4 OR c=6 OR c=d+1 THEN
 LET cc=-cc
 200 LET a=a+aa: LET b=b+bb: LET
 c=c+cc
 210 IF INKEY$="0" THEN GO SUB 4
00
 220 GO TO 100
 399 REM ■HITS■
 400 LET i=e+1: LET j=j+1: IF j=
11 THEN GO TO 3000
 405 BEEP .05,15
 407 IF ATTR (g-6,i)<>6 THEN RET
URN
 410 IF i=6 OR i=7 OR i=8 THEN L
```

```
 800 PRINT AT 10,8;"...";TAB 14,
"...";TAB 20;"..."
 810 NEXT n
 820 PRINT INK 0; PAPER 8;AT 17,
6;"S H O O T I N G";AT 18,8;"G A
L L E R Y"
 830 PRINT PAPER 2;AT 20,1;"Scor
e ";AT 20,20;"Hi-score "
 999 REM ■VARIABLES■
1000 LET a=8: LET b=6: LET c=7
1100 LET aa=1: LET bb=1: LET cc=
1
1200 LET e=14
1300 LET g=14
1400 DIM q$(9,1)
1500 FOR n=1 TO 9: LET q$(n)="■"
: NEXT n
1600 LET s=0
1700 LET j=0
1800 LET k=3: LET l=3: LET m=3
1899 REM ■PRINTS SIGHT■
1900 PRINT ; INK 6;AT 12,e;" ⊏ "
ET q$(i-6)=""
 420 IF i=14 OR i=15 OR i=16 THE
N LET q$(i-10)=""
 430 IF i=22 OR i=23 OR i=24 THE
N LET q$(i-15)=""
 460 LET s=s+5: PRINT PAPER 2;AT
20,6;s: IF s=45 THEN GO TO 3000
 470 RETURN
 699 REM ■SETS STAGE■
 700 BORDER 1: INK 7: PAPER 0: C
LS
 710 FOR n=0 TO 31 STEP 2
 720 PRINT PAPER 6;AT 0,n;" ";P
APER 6;" "
 730 PRINT PAPER 8;AT 1,n;" ";P
APER 6;" "
 740 NEXT n
 750 FOR n=17 TO 21
 760 FOR p=0 TO 31
 770 PRINT PAPER 0;AT n,p;" "
 760 NEXT p: NEXT n
 790 FOR n=5 TO 25
 800 PRINT AT 11,n;"■"
```



```
,AT 13,e;" L ",AT 14,e;" [ ",AT
15,e;" L ",AT 16,e;" L "
1910 PRINT AT 9,e-1;" >"
1920 RETURN
1999 REM ■GRAPHICS■
2000 FOR n=1 TO 2
2100 READ n$
2200 FOR p=0 TO 7
2300 READ q: POKE USR n$+p,q
2400 NEXT p: NEXT n
2500 DATA "A",0,60,126,126,126,1
26,60,0,"B",255,126,126,126,126,
126,126,255
2600 RETURN
2999 REM ■END■
3000 BEEP .5,1: BEEP .05,10
3100 IF s=45 THEN PRINT AT 4,6;"
YOU DESERVE A PRIZE"
3200 IF s<>45 THEN PRINT AT 4,2;"
 YOU CAN DO BETTER THAN THAT!"
3300 FOR n=1 TO 200: NEXT n
3999 REM ■NEW GAME■
4000 PRINT AT 7,10;"ANOTHER GO?"
,TAB 8;"PRESS- ", FLASH 1;"ENTER
"
4100 IF INKEY$=CHR$ 13 THEN GO T
O 4300
4200 GO TO 4100
4300 IF s>h THEN LET h=s: PRINT
PAPER 6;AT 20,30;h
4400 FOR n=4 TO 8: FOR p=1 TO 25
: PRINT AT n,p;" ": NEXT p: NEXT
 n
4500 PRINT PAPER 6;AT 20,6;"  "
4600 PRINT AT 10,e;"  ",TAB e;"
 ",TAB e;"  ",TAB e;"
 "
4700 GO SUB 1000
4800 GO TO 100
```

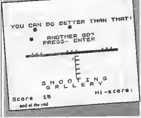
The screen display at the beginning of the game...



SHOOTING GALLERY

Score:

Hi-score:



YOU CAN DO BETTER THAN THAT!

ANOTHER GO?
PRESS- ENTER

SHOOTING GALLERY

Score: 15

Hi-score:

and at the end

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ADVENTURE ONE Features a save game routine as the game can take months to complete 'a remarkably good version... well worth the money' *Sinclair User* ZX81 £5.95

MAZEMAN A fast action m/c game that reproduces the spirit of the original. '...is very accurate and fast' ... *Which Micro?* Spectrum £4.95 ZX81 £4.45

CHESS 1.4 Ten levels of play with this m/c program Good graphic screen display 'In a class of its own *Your Computer...* ZX81 £5.95

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Take a stroll down the arcade

How do you choose from all the arcade clones on the market? Well, you could start by reading our reviews . . .

Gobbledegook
Jupiter Ace plus 16K
£7.95

Jupiter Cantab, Chesbunt Building, Bateman Street, Cambridge CB2 1LZ

If you feel a sense of *de ja vu* on running this ineptly-named piece of electronic cannibalism it will not be in any way surprising, for there is a maze full of dots, a mobile mouth to eat them, ghosts — sorry, gooks! (got to watch the copyright!) — to eat the mouth and powerpacks which give old munchy seven seconds in which to eat a gook. Sounds familiar?

There are two levels of difficulty and the screen instructions tell you that when eaten by a gook you "lose" one of your three lives. The program keeps your ingestion score and tempts you to try to better it.

The game is very fast and will tax the skill of even the experienced arcade addict, who will also presumably feel at home with the continuous noise emission which accompanies it.

A relatively expensive version of this tired old game with very critical volume level on loading

G.M.

instructions	75%
playability	70%
graphics	85%
value for money	60%

★ ★ ★

Spectrapede
48K Spectrum
£5.95

Protek, High Street, South Queensferry, Edinburgh EH30 9HW

In this attractively-presented game, you defend your mushroom patch by firing with a gun controlled by the cursor keys.

The main target is a centipede which moves down the screen and yields a score when hit but also breaks into two separate pieces.

Attacks by scorpions, spiders, worms and fleas add variety and the loss of three lives terminates each game

There are three degrees of difficulty and several players may compete by entering their initials so that their scores are shown on a score sheet display

While hardly unique, the graphics and action of this game are very good and the levels of difficulty about right both for the beginner and for others with more skill and practice. Most will find Spectrapede very good fun and many will become addicted.

H.C.

instructions	90%
playability	90%
graphics	60%
value for money	90%

★ ★ ★ ★

Road Toad
Spectrum
£4.95

dk'tronics, Unit 2, Shire Hill Industrial Estate, Saffron Walden, Essex

Another version of the well known Frogger, in which your objective is to steer a toad across a busy road, a snake infested stream, then a river full of turtles and logs, to reach the safety of a lily pad

You must, of course, avoid the wheels of the trucks and the mouth of the nasty old snake and, when you reach the river, you must cross by riding on the backs of the turtles and logs to avoid falling in

I have never understood why toads die when they fall in the river in this game, but I suppose it's poetic licence

Very colourful graphics, with detailed high resolution, and I particularly liked the movement of the snake

However, the use of sound effects could have been improved (only one short sound is used in the entire program) and the keyboard decoding allows you to use only one key at a time, preventing diagonal hopping. This reduces the element of skill involved

M.B.

instructions	30%
playability	90%
graphics	95%
value for money	90%

★ ★ ★ ★

Hopper
VIC-20
£5.99

Rabbit, 380 Station Road, Harrow HA1 2DE

OK, it's a frogger clone, how could you tell?

Many years ago I had a Nascom 1, which was a lovely computer. My favourite game for this machine (actually the only one I had) was called Lolly pop Lady Trainer and many happy hours I spent getting the little chickens over the road

Now I can relive those days with this excellent game. It is graphically well done, and tactically satisfying

User defined graphics are used in a most constructive fashion and the little frog is a cuddly fellow, unlike other frogs that I have seen **T.D.**

instructions	50%
playability	85%
graphics	90%
value for money	75%

★ ★ ★ ★

Munch-Man
48K Spectrum
£4.50

Astro Software, 28 Spinney Rise, Toton, Notts NG9 6JN

Yet another in the long line of Pac-Man games and in this, Astro have produced a good representation

You have three lives to play with and 10 levels of difficulty from 0 (slow) to 9 (fast). After 3000 points you are awarded another life. That is not as easy as it sounds as these ghosts seem to be intelligent enough to stop you from being reincarnated too often

The only criticism is that you move via the cursor keys and this does make the action a bit fiddly.

Despite this, it is a very good game for those who are addicted to this type of game and with the high score facility, it is good for two or more. **N.B.**

instructions	90%
playability	90%
graphics	90%
value for money	90%

★ ★ ★ ★

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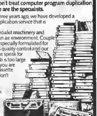

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The REMarkable REM

There's more to REM statements than meets the eye — here Ray Elder explains how they can be used to store data

A few weeks ago I wrote about strings and the Sinclair computer I suggested that they could be used to store data, but although this is perfectly valid, it does use a lot of memory.

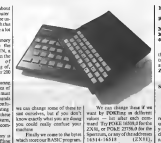
Don't forget that memory (RAM) is used to store the BASIC lines, and when RUN, a copy of the string is made in the VARIABLES section of memory. Therefore a string of, say, 100 characters takes over 200 bytes of memory.

There is a way of storing data which uses only one area of memory. To do this we must make use of the two commands which cause the greatest confusion to beginners to computing PEEK and POKE. To use these effectively we must, in turn, know a bit about the way a computer works.

The computer's memory is usually compared to a filing cabinet with each drawer numbered. We can look in any drawer (PEEK) or put a number into certain dsawers (POKE). The numbers we can use run from 0 to 255 inclusive for each drawer. The first drawer is 0, followed by 1, 2, 3 etc up to the end of the memory.

In the ZX81 the first 8192 drawers (bytes) are filled with instructions to the machine. These are read-only memory, and we can look at them by PEEKing but we cannot change them. The next 8192 bytes are unused. The Spectrum ROM however uses all the first 16384 bytes.

The next bit is our RAM memory that we can change at will. However, the first few bytes are used to hold special information for use by the computer as it works. These have to be in RAM as they are constantly changed and updated — and you can't change ROM memory. If we wish



we can change some of these to suit ourselves, but if you don't know exactly what you are doing you could really confuse your machine.

Finally we come to the bytes which store our BASIC program. The first two bytes contain the first line number, followed by two bytes which give the number of bytes used by the line — one for each character code plus one for the "end of the line" indicator.

Let's look at that in detail. Enter this program:

```
10 REM ABCDE
20 FOR I = 16509 TO 16519
30 PRINT I; " = "; PEEK I
40 NEXT I
```

Change line 20 to FOR I = 23755 TO 23765 for the Spectrum. 16509 and 23755 are the first addresses (bytes or "drawers") of our user RAM on the ZX81 and Spectrum. RUN this program n.

Note, the second number is the line number. The third number is the length of line. The fifth, number 234, is the code number for REM. Now match the codes for the remaining numbers, using the list given at the back of your manual.

We can change these if we want by POKEing in different values — list after each command. Try POKE 16509,0 for the ZX81, or POKE 23756,0 for the Spectrum, or any of the addresses 16514-16518 (ZX81), 23760-23764 (Spectrum) with various numbers.

If you want to confuse your machine POKE any of the numbers I have not mentioned — (LINE length, END of LINE marker) with a different value.

REM, of course, stands for REMark and the computer, on finding one of these, ignores the following bytes, therefore whatever we put after a REM is not going to affect the computer's operation.

The most commonplace usage for this (apart from genuine remarks!) is to store a machine code program. Here are some examples, for the ZX81 and the Spectrum. In all the following programs, when two lines with the same number are given, use the line appropriate to your machine.

Program 1

```
1 REM  (nineteen dots ZX81·
thirty three dots Spectrum)
10 FOR I = 16514 TO 16532
   (ZX81)
10 FOR I = 23760 TO 23792
   (Spectrum)
20 INPUT A
30 POKE I,A
40 NEXT I
```

Run this program and enter the following numbers, one at a time, pressing newline (or enter) after each one.

ZX81 14, 22, 42, 12, 64, 6, 32, 35, 126, 198, 126, 119, 16, 249, 35, 13, 32, 243, 201

Spectrum: 33, 0, 88, 1, 192, 2, 126,15,15,15,230,7,87, 126,7, 7, 7, 230, 56, 95, 126, 230, 192, 130, 131, 119, 35, 11, 120, 177, 32, 230, 201

Now enter program 2 — replacing your old lines — do not use NEW or delete line 1 (which, you will notice, now contains the characters whose codes are the numbers you entered).

Program 2

```
10 FOR I = 1 TO 75
20 PRINT AT INT (RND*22),
   INT(RND*32), "■" (NB-
   inverse space) (ZX81)
20 PRINT AT INT (RND*22),
   INT (RND*32), INK INT
   (RND*8), PAPER INT
   (RND*8),"X" (Spectrum)
30 NEXT I
40 RAND USR 16514 (ZX81)
40 RANDOMIZE USR 23760
   (Spectrum)
```

Seventy-five characters are printed on screen and then (line 40) the background and foreground is exchanged — a screen invert. Do the Spectrum the INK and PAPER colours for each of the attributes are exchanged. This can be a good effect in your programs!

And so, at last, to our DATA storing system. Ideally we want a way of storing a number of varying length words (or ▶

numbers), as efficiently as possible.

My solution (no doubt there are others, equally as good) is to prefix each data item with a byte which contains the length of the complete item, then when retrieving an item, use the "length" bytes to jump over unwanted data.

First of all make your list. To demonstrate I will use Monday, Tuesday, Wednesday etc. First count the number of words. Now count the total number of letters and add the two together.

This is the number of dots you will require in your REM — for my "days of the week" data I need 7 + 50 = 57 dots after 1 REM (but add an extra 35 bytes for a routine which I'll explain later). Now a program to POKE each item into place.

Program 3

```
10 LET X = 16514 (ZX81)
10 LET X = 23760 (Spectrum)
20 INPUT A$
23 IF A$ = "S" THEN STOP
30 LET A$ = CHR$ (LEN
   A$+1)+A$
40 FOR I = 1 TO LEN A$
50 POKE X, CODE A$ (I)
60 LET X = X + 1
70 NEXT I
80 GOTO 20
```

RUN this and enter your data one item at a time, pressing NEWLINE (or ENTER) after each one. Enter S to stop.

To retrieve an item, number N, use the following routine, either as a part of a program or as a subroutine (if it is to be used often).

Program 4

```
10 LET X = 16514 (ZX81)
10 LET X = 23760 (Spectrum)
15 IF N = 1 THEN GOTO 45
20 FOR I = 1 TO N - 1
30 LET X = X + PEEK X
40 NEXT I
45 LET D$ = ""
50 FOR I = X + 1 TO X +
   PEEK X - 1
60 LET D$ = D$ +
   CHR$ PEEK I
70 NEXT I
80 PRINT D$
```

D$ contains data item number N.

Program 4 uses 178 bytes of program memory plus the variables set up, but, most importantly, if your data list is a long one it takes a noticeable time to retrieve your data. So, as a final flourish, here is a machine code program to retrieve your data instantaneously. All in 32 machine code bytes plus 65 BASIC bytes!

At the end of our REM I said to add an extra 35 bytes — this is what they are for. The only difference between these routines is the location of the REM and variable addresses, ZX81 is as given, substitute the numbers in brackets ( ) for the Spectrum.

It is **essential** that the first line of your program (apart from the REM) is used to DIMension X$ (length of longest data item). Keeping to my example of weekdays I will enter:

```
5 DIM X$ (9)
10 FOR I = 16514 + N TO 16514
   + N + 31 (ZX81)
10 FOR I = 27360 + N + 32
   (Spectrum)
20 INPUT A
30 POKE I,A
40 NEXT I
```

N is the total number of words plus the total number of letters (57 in my example) + one, work out and note the start address 16514 + N + 1 (ZX81), 23760 + N + 1 (Spectrum).

Now run the program and enter these numbers one at a time as before. Once entered, SAVE your program — if you've made any errors you'll lose the lot!

6, 1, 33, 130, (208), 64, (92), 175, 184, 40, 6, 22, 0, 94, 23, 16, 232, 78, 13, 121, 35, 6, 6, 237, 91, 16 (75), 64 (92), 19, 16, 233, 237, 176, 79, 201

To use the routine POKE the data item — I to the start address + 1 and call it by LET D$ = X$ (to USR start address). For example, to pick a random weekday from my database:

```
5 DIM X$(9)
10 LET A = INT (RND*7+1)
20 POKE 16573, A - 1 (23819,
   Spectrum)
30 LET D$ = X$ (TO USR
   16572) (23818, Spectrum)
40 PRINT D$
```

I have deliberately used lengthy and expanded program lines to make the working of the system more obvious. Don't hesitate to modify, adapt and improve to suit your own requirements. These are simply ideas for you to use if, and when, appropriate.

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Cut-Off £5

Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

This is a fun game which one or two people can play on the standard machine (or faster with Extended BASIC) using keyboard or joysticks

The object of the game is survival. As you go along you have to avoid houses and your own or opponents track. At first all obstacles are visible but as the game progresses they become invisible. Further on, a bouncing ball comes into play and also has to be avoided.

You gain points for track laid and passing through flashing power squares. You have 11 lives so the game lasts a reasonable length of time

Unfortunately the game surround flashes along with the power squares, which makes it hard on your eyes, and although the invisible obstacles can be seen momentarily when you pass through flashing squares they aren't revealed when you crash with them

C.K

instructions	90%
playability	75%
graphics	70%
value for money	70%

★ ★ ★

Hong Glider Pilot £13 Extended BASIC

By Maple Leaf Micro Ware, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

If you have ever fancied soaring from a sheer cliff aboard a hang glider, but without the added thrill of breaking a leg or two, then this hang glider trainer is for you

The object of the game, for one to four players, is to jump from a ridge and glide for the greatest distance and time before landing safely in a designated landing zone. More difficult in practice than theory, a survival rate of around 30 per cent indicates (I hope) that the transfer is more difficult than the real thing

You are presented with a graphical display of your position on the landscape together together with 'instrument readouts covering such factors as height, orientation, wind speed and direction. Clouds of different sizes on the display indicate the positions of thermals which give lift

V.A

instructions	80%
playability	80%
graphics	70%
value for money	40%

★ ★ ★ ★

Splodge £5

Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

Cross the Gulf of Splodge, if you can! After listening to a repetitive tune for a full 1½ minutes the game was ready to play. I lost three lives in less than the set up time and the game was over. My second game was brought to an abrupt end by a 'bad subscript' report

On subsequent attempts I managed to cross the gulf, dodging 10 rows of obstacles which moved from side to side. My task was made easier after every successful crossing as some of the obstacles unplotted leaving a clear gap. Whether this is part of the program or an error I cannot say. At the end of the game the score, if high enough, is slotted in to a 'score table' and the player is invited to play again.

The graphics are fair but a better choice of colour would enable the player to see his piece more easily. The over-use of sound slows the game down. This game is unrewarding — TI-99 users deserve better!

C.F

instructions	5%
playability	30%
graphics	40%
value for money	30%

★

Devil Craze £12 Extended BASIC

By Maple Leaf Micro Ware, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 2DE

Your unlikely sounding hosts for this game are The Crazy Red Devil, The Great Imposter and The Five Big Bad Boys

Three rules govern this game of quick reflexes and decision making. Rule one — if the centre box colour matches the left box press 1 on the keyboard. If the centre box matches the right side, press 0. Rule two — if four red devils appear, do the opposite and finally rule three — ignore the great imposter

Confused? Upon completion you are rated according to your score, descriptions ranging from "Genuine Wimp" to "Grand Master")

At £12, plus an Extended BASIC cartridge, this simple game is likely to prove too expensive for most people. Good graphics and sound, superb presentation. Shame about the game.

V.A

instructions	70%
playability	40%
graphics	80%
value for money	30%

★ ★ ★

Tickworld £9

By Not Polyoptics, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

Tickworld takes place in a sparse jungle inhabited by eight man-sized and hungry ticks. You control a small figure, with the aid of the arrow keys on the keyboard, attempting to both avoid ending up as a mid morning snack and to capture the eight ticks with the aid of an unlimited supply of nets and eight cages

The only way to capture these nightmare-escapees is to throw nets around and hope they stumble into one as they move relentlessly towards you. Luckily their brains stayed normal size and this is not difficult

These are three skill levels to choose from, the only apparent difference being less trees to hide behind on the higher levels. Graphics and sound effects were quite impressive, adding much to the playability of the game

My only criticisms are the slow speed of the game and the extreme difficulty in gaining a foothold against overwhelming odds

V.A

instructions	50%
playability	50%
graphics	80%
value for money	40%

★ ★ ★

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.... POSTCODE ....
Signature .... Date ....

ZX81 PROGRAM

How long will you survive?

Dodgem is addictive, challenging — and fast, thanks to machine code. And it's not as daunting to type in as it looks, if you follow Ian Beynon's tips. You'll need a ZX81 plus RAM pack

The idea of Dodgem is to survive for as long as possible without hitting any of the obstacles which appear in your path

You also leave a deadly trail of waste fuel wherever you go which must not be touched at all costs You can move either up, down, left or right using the cursor keys and have three lives

Sounds easy? Well just try it! Any score over 1,000 is pretty good.

Dodgem runs on any ZX81 with 4K of RAM or more due to the method used to POKE characters onto the screen

The actual game is written entirely in machine code and stored within a REM statement at the beginning of the program

In order to enter Dodgem first of all type in the following program, making sure line 1 is at least 390 characters long as this is where the machine code is going to be stored.

```
1 REM      (at least 390 charac-
    ters)...  ..
10 POKE 16510,0
20 FOR N = 16514 to 16903
30 INPUT A
40 POKE N,A
50 SCROLL
60 PRINT N,A
70 NEXT N
```

When you have entered the above program, RUN it and enter the decimal numbers provided in **Listing 1.** The five-figure numbers on the left should not be entered as these are the addresses of where the numbers are being stored

Enter each line of numbers in turn starting from the top and working from left to right remembering to press NEWLINE after each number (ie O (N/L) 33 (N/L) 34 (N/L) etc.)

If you should happen to enter a wrong number make a note of the address at which the error occurred and then correct it afterwards with a direct POKE command (eg if address 16706 should have contained 238 then enter POKE 16706,238)

When you have finished entering the machine code immediately enter the program in **Listing 2.**

Before you RUN the program you should first SAVE it just in case you have programmed in an error which will probably result in a crash

If this does happen then use the machine code loader program with lines 30 and 40 deleted and line 60 changed to PRINT N, PEEK N to check through your entries Any mistakes should now come to light and can be corrected.

Memory locations of interest include

16522 speed of game (normally 10, 1 = impossible 20 = slow)
16515 character code for left key
16516 character code for down key
16517 character code for up key
16518 character code for right key

POKEing location 16515 enables you to define your own keys for the game For example, if you wanted X to control your downward movement then enter POKE 16516, CODE "X"

The only two variables used in the game are those that keep track of the score and high score. The high score is contained within the BASIC variable HS while the current game score, which is updated by part of the machine code, resides in memory locations 16519 and 16520 and is evaluated by the expression

PEEK 16519 + 256 × PEEK 16520

Listing 1

```
16514    0     33    84    38    35
16519    0     0     5     18    197
16524    5     255   15    254   193
16529    16    245   52    37    42
16534    12    64    17    22    3
16539    25    190   32    6     54
16544    25    43    24    246   62
16549    42    138   64    35    34
16554    135   64    205   157   8
16559    66    77    61    20    62
16564    0     40    4     205   169
16569    7     126   6     4     79
16574    33    131   54    125   185
16579    46    8     35    18    249
16584    24    3     50    130   64
16589    65    130   54    33    131
16594    64    190   202   22    65
16599    35    190   202   141   66
16604    35    190   202   236   64
16609    35    190   202   52    65
16614    206   193   65    6     0
16619    79    33    33    0     9
16624    66    77    209   209   65
16629    1     214   2     42    12
16634    64    9     64    93    1
16639    151   2     42    12    64
16644    9     237   164   205   225
16649    66    42    12    64    17
16654    90    1     25    54    165
16659    199   137   64    205   247
16664    68    71    33    2     0
```

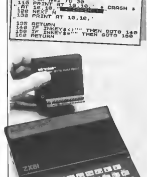
```
16669    17    33    6     25    16
16674    253   55    77    255   209
16679    68    42    12    64    17
16684    30    6     25    6     21
16689    197   17    33    0     26
16694    229   54    93    19    1
16699    38    0     237   184   226
16704    193   16    236   205   225
16709    65    42    12    64    17
16714    90    1     25    54    147
16719    195   137   64    205   247
16724    55    71    33    31    0
16729    17    33    0     25    16
16734    253   55    77    209   209
16739    68    42    12    54    35
16744    35    35    6     21    197
16749    17    33    0     95    229
16754    64    93    27    1     30
16759    0     237   176   225   193
16764    16    236   203   225   66
16769    49    12    64    17    90
16774    1     25    64    146   195
16779    137   54    205   193   65
16784    5     0     79    33    161
16789    2     9     68    77    205
16794    209   55    42    12    54
16799    1     161   2     17    55
16804    0     95    229   42    12
16809    64    17    33    0     35
16814    235   225   237   176   205
16819    225   55    42    12    64
16824    17    90    1     25    54
16829    167   195   137   64    237
16834    95    71    55    52    64
```

ZX81 PROGRAM

```
16839    128   6     30    144   46
16844    253   128   60    68    201
16849    42    12    64    9     54
16854    4     42    12    64    17
16859    90    1     25    54    27
16864    201   42    12    64    17
16869    90    1     25    128   254
16874    4     40    4     254   27
16879    32    5     193   237   75
16884    135   64    201   237   95
16889    71    58    52    64    128
16894    8     21    144   48    253
16899    128   80    201   0     0
```

Listing 2

```
  5 LET HS=0
 10 POKE 16418,0
 11 POKE 16519,0
 12 POKE 16520,0
 13 POKE 16514,0
 14 CLS
 15 PRINT AT 23,0,"
     SCORE 00000   HIGH SCORE
 18 PRINT AT 23,12,HS
 20 LET L=USR 16821
 28 GOSUB 100
 30 LET L=USR 16821
 38 GOSUB 100
 40 LET L=USR 16821
 50 PRINT AT 10,8,"  GAME OVER
 
  55 PAINT AT 18,0,"  PRESS ANY
KEY TO PLAY AGAIN"
 68 IF L>HS THEN LET HS=L
 70 GOSUB 140
 80 GOTO 10
100 FOR N=1 TO 30
110 PRINT AT 10,10," * CRASH *
",AT 10,10,"  CRASH  ".
120 NEXT N
130 PRINT AT 10,10,"
"
135 RETURN
140 IF INKEY$<>"" THEN GOTO 140
150 IF INKEY$="" THEN GOTO 150
160 RETURN
```



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How did the chicken cross the motorway?

. . . with difficulty, because the traffic starts vanishing. Glyn Cornfield's game needs Extended BASIC and optional speech synthesiser

Who needs Frogger when you can play Motorway?

Game instructions are included in the program and the game is very simple to play. Features are nine skill levels, more vehicles at 1,000 points, invisible vehicles at 2,000 points and, should you reach 3,000 points, all vehicles are invisible.

Extended BASIC is required and the speech synthesiser is optional.

The game can be made more difficult by increasing the number by which SK is multiplied in the sprite commands (should you be suicidal). I hope you enjoy the game and good luck. My highest score on level one is 3540 (I haven't dared go beyond level one yet).

How it works

- 210-220 test if speech synthesizer is attached
- 230 calls subprogram named instructions (940-1080)
- 240-250 input skill level
- 260-370 set screen display
- 380 defines characters 128-130
- 400 congratulations on reaching opposite bank
- 420 crash routine for loss of life
- 430 sets original position of chicken
- 440-520 define sprites
- 530-560 display messages
- 570-580 make vehicles invisible
- 590 input of movement
- 600 check for crash
- 610 if no key pressed GOTO 590
- 620-630 test if chicken hits edge of screen
- 640-690 move chicken and change score
- 700-710 display score, lives
- 720 return to input
- 730 clears screen
- 740 calls subprogram named dead (810-930)
- 750-780 asks if another game is required
- 790-800 end program
- 810 start of subprogram named dead
- 820 crash sound
- 830-840 clear all vehicles
- 850 sets backround to red
- 860 redefines all characters to normal
- 870-900 sets colours to black on red with white border
- 910-930 print messages, end sub program
- 940 start of subprogram named instructions
- 950-970 call sprites to spell MOTORWAY
- 980 plays siren sounds
- 990-1040 display instructions
- 1050 any key to continue
- 1060 data for line 980
- 1070-1080 ends subprogram

Hints on conversion

The program would be very difficult to convert to another computer as I have great use of the sprite command which enables characters to move smoothly across the screen. Having said that here is a list of commands and what they do

CALL SPRITE(a,b,c,d e,f,g) Defines a sprite number of a character ASCII code b,colour c,starting at row d column e with a velocity of f and g

CALL COINC(ALL X) Detects all sprites to see if a coincidence has occured and returns a value of − 1 to X

CALL DELSPRITE(ALL) Clears all sprites

CALL SAY("A$") Uses speech synth to say A/S

CALL COLOR(A,B,C) Sets character group A to foreground colour B background C (a,b) Sets sprite number a to colour b

CALL KEY(O,K S) Input from keyboard key pressed is K,S tests if key has been pressed returns O if no key pressed

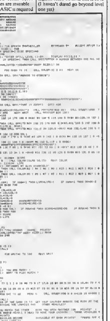
CALL LOCATE(n x,y) Locates sprite number a to row x, column y

CALL MAGNIFY(2) Doubles size of all sprites

CALL CHAR(x,n$) Defines ABCII code x to hex string n$

CALL PATTERN(x,n) Redefines sprite number x to character code n

CALL SOUND(d,n,v) Creates a sound of d milliseconds, frequency n at volume v



Here's a new way to jump the bus queue ...

Fancy yourself as a daredevil stunt rider? Paul Scrutton gives you the opportunity with his game for the unexpanded VIC-20

Wheelies, for the unexpanded VIC 20, is a very similar version of the old and famed program Stunt Rider

Although the program is written in BASIC, it is surprisingly fast, and uses the VIC's excellent user-defined graphics and sound facilities

Using the Commodore key for accelerate and either shift key for decelerate, you attempt to make the motorcyclist jump as many buses as possible

First of all, you have to jump one bus, then two, then three ...... etc Each time 12 buses have been cleared — should you manage 12 — a melody is played and you are told how many buses you have cleared

Your score 10 points per bus), and the high score, is updated throughout the program.

When you are typing in the program, you must abbreviate many of the keywords — see page 133 of the VIC manual — to fit the line in 88 characters, the maximum per line

If you type a line in and a syntax error results, you have probably not abbreviated a sufficient number of keywords These abbreviations are necessary because each new line takes up more memory and therefore, more commands on one line reduce the amount of memory taken up As it stands, the program just, and I mean just, fits into the unexpanded VIC

The inverse characters you see from time to time in the LISTing, are colour or cursor control codes These are shown in **figure 1.**

Also, in lines, 20, 30, 63, 650, and 2005, graphic characters denote upper-case characters when the program is RUN

Figure 1 — what the inverse characters mean

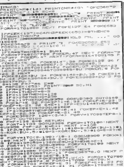
```
■ CLR
■ CTRL & BLK
■ CRSR DOWN
■ CRSR RIGHT
■ CTRL RVS ON
■ CTRL & RVS OFF
■ CTRL & YEL
■ HOME"
```

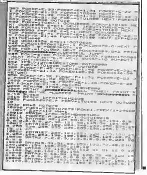
Main variables

W(8) array holding notes for tunes
A keyboard input and also used generally
P screen memory location of start of horizontal line on which bike is positioned
E number of characters bike has moved from edge of screen
BU number of buses to be jumped by bike
S current speed of bike (between 130 and 255)

How it works

0-60 set up title page, assign some variables
61-63 sets up user-defined graphics if they haven't already been
70-90 assign more variables, set up screen display
80 draws the three horizontal lines
81 draws first ramp
82 draws buses
84 draws second ramp
100-140 checks keyboard, alters speed accordingly
150 check to see if motorcycle is at end of one of the lines
155 deletes motorcycle, check for first ramp
159-165 draw motorcycle, alters sound, delay program, dependent on speed of motorcycle
300 routine for moving bike down to next line
500 routine for moving motorcycle up ramp
515 decides whether bike will crash or not
520-540 move bike along over buses and down to crash on buses or ground
555-570 stops engine sound, plays tune, destroys bike
600-625 move bike over buses down ramp and along until it reaches edge of screen
640-670 play tune, check to see if 12 buses have been jumped
900 draws bike in wheelie position, and first ramp
990 deletes bike
1000 draws bike in wheelie position
2000-2030 displays no. of buses cleared and plays a melody
10000 routine for defining graphic characters





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[illegible]

50 for the high resolution screen. 50 for the [illegible] screen.

[illegible]

[illegible]

[illegible]

[illegible] per pad.

[illegible]

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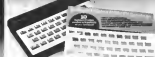

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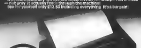

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Mazes make the game . . . here's how to construct them

Writing your own 3D maze game? Allen Webb's detailed advice will help you design mazes to lose yourself in

For some reason, which psychologists can probably explain, the maze is one of the commonest devices used in computer games

The use of graphics to generate a 3D maze is of particular value since the player actually experiences the sensation of being lost in a labyrinth

Early programs achieved this by using the standard character set to draw the maze. While the effects produced by this approach are reasonable, the method is limited in resolution and flexibility

Since most home computers now have high resolution, more interesting effects can be achieved This article describes an algorithm for displaying 3D mazes using high resolution graphics The program is reasonably machine independent, and I will give enough details to aid in conversion

The best way of describing a maze is to divide it into square cells, each allocated a value depending on which sides are walls and which are passages

If each side is considered to be one bit of the cell value, a value of 1 will represent a wall and a value of 0 a passage

Calling the north-facing wall bit 1 and counting clockwise, the cell values are formed as shown in **figure 2.** A cell with one wall on the west side will have a bit pattern of 1000 (binary), ie a cell value of 8 (decimal) **Figure 3** shows a maze split up into cells

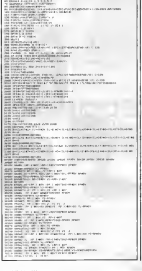
By using a simple test, it is possible to examine the cell value to establish which directions are passable The secret is to give each direction a value (west = 1, south = 2, east = 3, north = 4) and test the corresponding bit in the cell value

The expression in line 360 of listing 1 performs this test and returns a 1 if you face a wall or 0 if you face a passage

Consequently, moving simply involves changing direction as required, testing the way you face and moving to the next cell Lines 2010 to 2140 do exactly that

In order to avoid cluttering up the screen with prompts, movement commands are input via a GET statement.

I have deliberately restricted the behaviour of the program to normal movement First you may only move from one cell to the next by inputting F for forward, L (left), R (right) and B (backwards) simply change the direction you face.



In order to save memory, the cell details are stored in two blocks of RAM and accessed by PEEKing and POKEing The first block of RAM starts at location CA (see lines 90 and 70) and holds the cell values described earlier

The second block starts at location AA (see lines 80 and 90) and holds the "cell attributes" These attributes contain a flag which is used in the maze routine, but they can also be used to indicate if the room contains anything etc etc. Functions FNA and FNB control the storage and access of the cell data and use the x,y coordinates of the given cell

Most of the routine handles the actual graphics commands and logic, the main problem being the necessity of drawing a passage of several cells using the minimum number of graphics routines

The minimum number of basic views is 9 (see **figure 4**) and these views are drawn by nine routines accessed by line 30000 In order to get a good perspective effect, the view of each cell is drawn smaller as the cell gets further away

This is achieved by use of two scaling factors, DM and DY and the position of the cell relative to the players position (RP) The constants in line 100 (currently 2 3 and 4) can be altered to suit the aspect ratio of your screen

The number of cells ahead that you can see is set in line 90 as NC Lines 240-340 examine each cell in sequence in your line of sight and draw the view of each cell

This is continued until the required number of cells has been drawn, or until a blank wall is encountered The algorithm in figure 1 gives the details of the method used

The routine was developed on a VIC-20 with a Super Expander, but I have tried, wherever possible, to avoid using machine dependent commands

You will see from listing 1 that the main conversion work involves the drawing routines Line 90 sets up the resolution limits of the graphics (X1,X2,Y1,Y2), set these to your own values The graphics ▶

commands used have the following syntax.

DRAW 2, X1,Y1 TO X2,Y2 draws a line from (X1,Y1) to (X2,Y2)

DRAW 2 TO X2,Y2 draws a line from the current point to (X2,Y2)

The number following the word DRAW specifies the colour of the line, ie 2 draws the line in the character colour, 0 uses the screen colour

PAINT 2, X1,Y1 fills the enclosed area with colour

POINT 2, X1,Y1 sets the point at X1,Y1

SCNCLR clears the high resolution screen

GRAPHIC2 sets up mode 2 graphics

CHAR R,C,text writes the text on row R starting at column C

Several of the statements use Boolean functions In Commodore computers true returns a value of −1 and false a value of 0 If your machine uses different values then you should change these lines 250,300,2085,2090,2250,2280 accordingly.

Lines 2190-2195,2200-2225, 2250,2280-2285 are simple ways of performing multiple IF statements and should be changed in a similar way Line 220 writes your current heading at the top of the screen

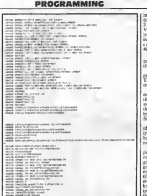
Variable 80 in line 90 allows for the silly scaling system used by the super expander Set it to zero for other machines

I mentioned earlier that two areas of RAM are required for data storage This RAM must be protected from corruption and will depend on your machine If you are using a maze of X cells wide by Y cells high, you will need to reserve X * Y bytes for each storage area. Line 10 does this for the VIC Ignore this line for other machines

The section of listing 1 starting at line 40000 will give a map of the maze if M is input at the move stage This routine uses the attribute array to draw the explored portion of the maze (attribute = 0). The unexplored regions (attribute = 128) are filled in

Only a 20 by 10 array of cells is drawn, so if your maze is larger than this, only a portion of it will be displayed. Lines 40000-40010 trap mazes smaller than the displayed size

Lines 40020-40070 decide which portion of the maze is drawn such that you get the best view from your current position (the logic is not designed to handle long thin mazes with one dimension less than the displayed area and one dimension greater).



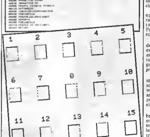


FIGURE 2 CELL VALUES

The drawing routine examines the cells in the range XS to XF and YS to YF and either draws the cell details or a dark square, depending on the attribute of the cell. The cells are drawn starting at the top left hand corner

The actual drawing coordinates will vary depending on the position of the origin used by the graphics commands

Listing 1, lines 40150-40220 and 40260-40300, give the commands for the Super Expander (origin top left corner) Listing 2 gives the commands for the VICKIT chip (origin bottom left corner) While the line numbers are different, listing 2 corresponds to lines 40080-40380 in listing 1

Line 40240 waits for you to press a key before returniong to the main routine

Basically there are two approaches to designing the maze The choice depends on the type of application

First you can have a fixed maze, eg lines 20-60 represent the maze in figure 3 This system is acceptable provided the maze is big enough, say 50 by 30, to make exploration difficult

As such, this approach is ideal for dragon and dungeon type adventures The main draw back is that the design of such a maze is very time consuming

The alternative is to use a program to design a random maze Listing 3 is such a program If you provide the program with the dimensions of the maze and the storage address (CA) it will create and save the maze Any commands in square brackets represent cursor control commands for formatting the display TI$ is the internal clock ouput.

This routine har not been optimized and is therefore rather slow (a 50 by 30 maze will take about 20 minutes) Perhaps one of you readers can come up with a better routine

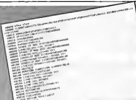
Listing 1 har been designed deliberately to provide ease of expansion The most obvious area of use would be an adventure type scenario in which the graphics are used to draw objects, monsters, stairs etc.

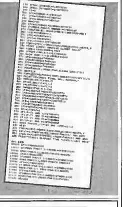
It is a simple matter to use sample drawing routines with scaling factors to draw objects which appear in the distance and grow larger as you approach them A coloured in ellipse makes a realistic pit

The attribute value is the best way of allowing for objects etc Bit 7 is alrexdy used for the map routine, but the other bits lexve you with 127 more attributes, eg bit 1 set = pit in ground, bit 1 and 2 set = dragon etc

I have presented what I hope is a versatile maze program which can be adapted for most machines

The actual memory used up by the routine is not excessive and owners with 16K or more memory should be able to extend it without any trouble Really it's all down to the imagination





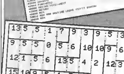
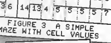

13 5 5 1 7 9 3 9 5 3
9 5 5 0 5 6 10 10 9 6
12 1 5 6 13 5 4 2 12 3
15 10 9 5 1 5 5 6 13 6
13 6 14 13 4 5 5 5 5 7

FIGURE 3 A SIMPLE MAZE WITH CELL VALUES



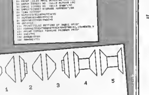


FIGURE 4

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Top Ten programs for the Dragon-32

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2	Talking Android Attack	Microdeal (2)
3	Space Wars	Microdeal (5)
4	Nightflite	Salamander (3)
5	Dragon Trek	Wintersoft (4)
6	Graphics System	Salamander (6)
7	Katerpillar Attack	Microdeal (7)
8	Planet Invasion	Microdeal (–)
9	Dragon Trek	Salamander (–)
10	Mined Out	Quicksilva (9)

Compiled by Boots Figures in brackets are last week's positions

Top Ten programs for the Spectrum

1	Penetrator	Melbourne House (1)
2	Jet Pac	Ultimate (3)
3	Flight Simulation	Psion (2)
4	The Hobbit	Melbourne House (5)
5	Transylvanian Tower	Richard Shepherd (4)
6	3D Tanx	dk'tronics (6)
7	Horace Goes Skiing	Psion/M House (8)
8	Ah Diddums	Imagine (7)
9	Starship Enterprise	Silversoft (–)
10	Test Match	Computer Rentals (–)

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1	Arcadia	Imagine (1)
2	Asteroids	Bug Byte (4)
3	Wacky Waiters	Imagine (2)
4	Panic	Bug Byte (5)
5	Cosmiads	Bug Byte (6)
6	Hoppitt	Commodore (6)
7	Kaktus	Audiogenic (7)
8	Amok	Audiogenic (10)
9	Alien Blitz	Audiogenic (–)
10	Mangrove	Audiogenic (9)

Compiled by Boots Figures in brackets are last week's positions

Top Ten programs for the ZX81

1	City Patrol	Sinclair (–)
2	Flight Simulation	Sinclair (1)
3	Fantasy Games	Sinclair (3)
4	Football Manager	Addictive (2)
5	1K Games	Sinclair (4)
6	Defender	Quicksilva (5)
7	ZX81 Chess	Sinclair (6)
8	Planet of Death	Sinclair (–)
9	Space Raiders	Sinclair (9)
10	1K Chess	Sinclair (–)

Compiled by Boots Figures in brackets are last week's positions

Price wars — the makers strike back

It appears that everyone is trying to get into the large market for low cost home and personal computers over here Just recently, both Radio Shack (known to you as Tandy) and Timex/Sinclair have announced new machines

Radio Shack has debuted the model TRS-80 MC 10 which retails at $119 95 Its target is first-time users It comes with 4K RAM expandable to 20K by use of a plug in module (available later in the year) The machine is capable of producing eight colors for graphics

Although there is no software immediately available (how typical), the firm has indicated that essentially any program that runs on a 4K Radio Shack Color Computer will run on the new machine with few modifications

The new machine looks a lot like the Timex/Sinclair 2000 (Spectrum to you) with its small pad keys which have graphics symbols and letters on them, and secondary BASIC functions assigned to various letters The MC 10 comes with a serial port allowing the unit to address modems and printers, and with a cassette input/output port

* * *

Rather that just come out with a brand new machine, Timex has also opted to upgrade its model T/S 2000 color computer — an improved Spectrum — by expanding its display It will now display 64 columns and 24 lines as well as 32 by 24

The new machine is called the T/S 1500 It is priced in the middle of the line and is said to be compatible with the lower priced 2K 1000 (ZX81 in the UK) It is a monochrome computer that seems to be targeted at the educational market When it becomes available next month, it will sell for about $80

It comes with 16K RAM, and is expandable to 32K via an optional T/S 1016 memory module Having a small pad keyboard with 40 keys, it can produce 22 graphics characters and an additional 22 special characters Unlike its big brother, the 2000 it is supposedly completely compatible with all hardware and software available for the 1000

It is interesting to observe the results of the on-going price wars among the low cost computer manufacturers Timex, which contributed greatly to the start of the wars, was basically forced to redesign two of it's machines in order to compete

In January at the Winter Consumer Electronics Show in Las Vegas, it debuted two models of the 2000, one with 16K RAM and the other with 48K Those machines were to be marketed at $149 95 and $199 95

Now they have been replaced by machines coming with 24K and 48K of RAM while still being offered at the price announced in January To take advantage of the memory increase and to speed up applications programs, the 2000 now uses bank switching techniques

When it becomes available "next month", the 2000 will be factory supported by no less than 40 software packages Right now the company offers over 100 packages for the 1000 which supposedly can also run on the new 1500 The cartridges scheduled for the 1500 should be out around August and cost between $13 and $30

I wonder who will start the next war? When the manufacturers have gotten all the mileage they can out of lowering the cost I suppose the next race will be to see who can offer the most features without raising the cost of the computer I shall let you know what happens

Bud Izen
Fairfield, California

Games to gamble on

You might lose your cool, but at least you won't lose your shirt in these computer simulations of gambling games. Is it worth gambling hard cash to buy them? See what our reviewers thought

Jackpot VIC-20 £5.50

Mr Chip, 1 Neville Place, Llandudno, LL30 3BL

This program offers a rather good simulation of a fruit machine. You are presented with a nicely laid out display of a four reel fruit machine showing a well designed fruit symbols.

When you press F7 the reels rotate in a highly realistic manner. The simulation comes with the full range of options such as hold, nudge and gamble.

The nudge option offers a variable number of nudges and you can nudge in either direction of spin the reel of your choice. Each operation is accompanied with different sound effects or tunes. You start with ten pounds to spend.

Overall jackpot is a beautifully written simulation giving superb graphics, animation and use of colour. In fact, this progam makes Commodore's fruit machine cartridge look unbelievably cheap and nasty.

A.W.

instructions	80%
playability	90%
graphics	95%
value for money	95%

★ ★ ★ ★ ★

Monte Carlo Spectrum £4.95

Micromega, 230-236 Lavender Hill, London SW11 1LE

Two games on one cassette sounds like good value — and it is! Here, Micromega presents two casino games, Blackjack and Craps.

Your Spectrum plays for the house in both cases but is kind enough to let you win at least some of the time. The screen display is inventive and features some novel uses for the user defined graphics; I really like the hand that rolls the dice! You could also learn a thing or too from the way in which the programs are writtan.

The games themselves are straightforward. Blackjack is a form of pontoon and Craps is merely betting on the fall of the dice. But somehow, even though the idea is simple, unoriginal and I'm not a gambler, the programs held my attention.

D.M.

instructions	95%
playability	90%
graphics	80%
value for money	95%

★ ★ ★ ★

Mini-Roulette Pontoon Hi-low VIC-20 £5.50

Mr Chip, 1 Neville Place, Llandudno LL30 3BL

This cassette contains three card games in one program. You have £50 to gamble with and can move from game to game as the mood takes you.

The games themselves are Pontoon, Roulette and Hi-low. Pontoon needs no comment apart from that it contains the usual features. In roulette you have to guess the nature of the next card to be turned up: red, black, odd, even, picture or which suit. Hi-low is the same as a well known TV game in which you guess if the next card is higher or lower than the last.

The instructions are comprehensive and are loaded separately to the main games program.

On the whole a well written if rather unexceptional collection.

A.W.

instructions	95%
playability	80%
graphics	65%
value for money	90%

★ ★ ★

Challenge Poker TI-99/4A £7

Pewterware, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

Challenge Poker is something of a cross between Poker and Bingo. But don't let that put you off! This is a playable and challenging game for all TI-99/4A owners.

For one of four players, the aim is to complete standard five card poker hands along the rows, columns or diagonals of a five by five square gamesboard, the centre square being occupied by a 'wild card'. Twenty-four cards are drawn at random by the computer and placed by each player, in turn, on their board.

Points are scored ranging from 1 point for two pairs to 9 points for a straight flush. The game continues until any player has 100 points. I was particularly pleased with the good colour graphics of this game.

One noticeable drawback, however, is that only one player's board is displayed at a time, this being re-drawn for each player. This becomes slow and tedious with more than two players.

V.A.

instructions	70%
playability	70%
graphics	80%
value for money	60%

★ ★ ★ ★

Roulette Spectrum £4.95

Micromega, 230-236 Lavender Hill, London SW11 1LE

Gambling without cash lacks a certain je ne sais quoi (French inspired by the game's command 'Faites vos jeux'). Micromega's Roulette is fun — in small doses.

Playing involves selecting your bets, inputting your stakes and pressing SPACE to gamble your chips. Your money is adjusted accordingly. The house-limit of 500 will be annoying for the reckless but it is an accurate one-player simulation with all bets possible.

A ball rolling round a spinning, coloured wheel provides scope for stylish graphics, this opportunity was not seized by Micromega. When you spin the wheel a flashing, changing number and a line drawing of a roulette wheel appear. Not very adventurous! Sound is used effectively throughout, though.

The inveterate gambler could probably find better ways of spending £4.95. However, this game may provide a change for people tired of blasting helpless aliens.

C.L.

instructions	70%
playability	70%
graphics	45%
value for money	60%

★ ★

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765	1 818	2 942	1,952	631	93

A GRAND TOTAL OF 8,201 (EIGHT THOUSAND, TWO HUNDRED AND ONE DIVIDENDS – so far)

I HOLD THE UNCHALLENGED WORLD'S RECORD FOR POOLS WINS

I AM MAKING THIS VERY SPECIAL REDUCED PRICE OFFER TO READERS OF HOME COMPUTING WEEKLY FOR A LIMITED PERIOD ONLY

Do not let anyone tell you that it is impossible to WIN ON THE POOLS – since I perfected my method, **I HAVE WON REGULARLY** for over **TWENTY FIVE YEARS** – proof that it is no flash in the pan

I have CHALLENGED THE WORLD with my record of wins and with all the evidence that I possess – NO ONE has ever been able to accept the Challenge – I KNOW NO'ONE EVER WILL

MY SECRET IS NOW PLACED ONTO COMPUTER CASSETTE FOR YOU

THE METHOD IS THE GREATEST TREBLE CHANCE WINNER IN THE HISTORY OF FOOTBALL POOLS – IT WILL LAST FOREVER – BOTH FOR ENGLISH AND AUSTRALIAN FOOTBALL POOLS WITH EQUAL SUCCESS

I now intend to give a limited number of people the opportunity of making use of my method – perfected over 25 years and proving itself on **EVERY ONE OF THOSE TWENTY FIVE YEARS**

You will have noted details of my personal achievements so far, as given to you above

A GRAND TOTAL of 8,201 yes 8 201 POOLS DIVIDENDS, including **765 FIRST DIVIDENDS**

My Pools Winnings Dividend slips now number so many that they fill a very large suitcase and will stand as my evidence of all claims in **ANY COURT OF LAW IN THE WHOLE WORLD**

Taking just the past 25 years into consideration, I have won ON AVERAGE over 328 (THREE HUNDRED AND TWENTY–EIGHT) Pools Dividends **EVERY YEAR** – or – AN AVERAGE of over **SIX DIVIDENDS EVERY WEEK** for **TWENTY–FIVE YEARS**

You have my absolute Guarantee of the complete authenticity of every claim, cheque, document, letter, etc, contained herein

I do have losing weeks, but ON AVERAGE my winnings show over SIX DIVIDENDS **EVERY WEEK** for the past 25 years

I know that you are now utterly flabbergasted, it always happens to everyone with whom I come into contact. Please just sit back and **imagine** for a moment my **FIRST DIVIDEND** wins alone – they now number 765 (seven hundred and sixty five) and will probably be even more by the time this advertisement appears in print

I AM NUMBER ONE IN THE WORLD AND NO ONE DISPUTES IT

For as long as I continue to enter the Football Pools my wins will continue. I have already said they apply with equal success to both English and Australian Football Seasons

I intend to release a STRICTLY LIMITED NUMBER of copies of my cassette, (either for Sinclair ZX81 or Sinclair Spectrum) – DO NOT DELAY AND FIND YOU ARE TOO LATE in which case I would have to refund your money

I am so confident of **YOUR** success that if **I do not** win at least THREE FIRST TREBLE CHANCE DIVIDENDS in the first 20 weeks of entering, I will completely cancel the balance of the purchase price and you do not have to pay me another penny, at any time, no matter how vast your winnings

I only wish that space would allow me to give you photographs of my winnings slips, cancelled cheques, etc, but it is of course impossible – they now number 8 201 dividends. I have however given JUST A FEW EXTRACTS from ORIGINAL LETTERS I hold from my small Clientele

I am the Inventor and Sole Proprietor of my method, Registered as EUREKA – (I have found it') I am known as The Professor in Pools Circles – I am of the Highest Rank in Forecasting – this is beyond dispute. I am marketing a limited number of Computer Cassettes, under my Registered Company – FOOTBALL ENTERPRISES

My initial charge for a copy was £75 but for this SPECIAL REDUCED PRICE OFFER I will send you a copy, (for ZX81 or Spectrum) for £20, (twenty pounds) ONLY, plus your Promise to pay me the balance of £55 – **ONLY** IF YOU WIN AT LEAST THREE FIRST TREBLE CHANCE DIVIDENDS IN YOUR FIRST 20 WEEKS OF ENTERING – otherwise you owe me NOTHING FURTHER.

This is surely proof absolute of my supreme and utter confidence in my own abilities and in the capabilities of my discovery. I could easily CHARGE £2 000 per cassette on the evidence I possess, but that would not be fair to everyone, which is what I want to do

My method is WORLD COPYWRIGHT, any infringement and immediate proceedings will be taken without prior warning. It is truly ingenious and has stood the test of time

My cassette is simplicity itself to operate and you'll be given FULL DETAILS for weekly calculating. Your entry need not involve you in any large weekly stakes you can enter for as little as 25p, if you wish

I charge NO COMMISSION on any of your wins – no matter how BIG they may be

I realised a long time ago, that it was no good sitting down and **dreaming** about winning the pools so I burnt the candle at both ends, working late into the night occasionally RIGHT THROUGH THE NIGHT. I **KNEW** there was a way, eventually it all paid off and has been doing so ever since

I am unable to vary my offer to anyone so please do not request it, as I shall very easily dispose of the cassettes I have prepared and am making available

IMMEDIATELY I perfected my method I commenced winning right away, (first with just a little £163, the first week I used it), I HAVE NEVER LOOKED BACK SINCE amongst all those dividends was one for over **EIGHT THOUSAND POUNDS** for just **one eighth of a penny stake**.

I will release a copy on cassette, to you on receipt of the completed order form and your Signature thereon confirming you will treat it in the STRICTEST CONFIDENCE between us and retain it for your **OWN USE ONLY**.

PLEASE NOTE.
If you happen to be the proud owner of a Computer, **other than** a Sinclair ZX81 or Sinclair Spectrum, you can still purchase a copy of my method for the same price and program it YOURSELF on to YOUR OWN COMPUTER.

Don't take my word for it, read what people write about me and my method –

I won on Zetters last weekend. It was not a big sum, but all the same it was a very nice surprise for me
J C , Lancs

I appreciate the straightforward method you adopt which is such a contrast to the rubbish of misrepresentation which is so common in the Betting World, by unscrupulous and self-opinionated charlatans
C.H , Devon

Winnings cheque received today sincere thanks
D N , Devon

I congratulate you on your achievement
R R Wales

I should like to thank you for a most exciting season and look forward to hearing from you again.
J C Hants

I would like to acknowledge cheque and say how much I appreciate your integrity
J M , Scotland

Many thanks for your system, it is all you say and more
J C , Lancs

Your wonderful system won me £3,527 I intend to visit London soon and will be able to come and see you personally
(Overseas Client) F M , Kampala

Many thanks for trying so hard to please us all, your brother should be thanked also. One of our daughters, WHOSE HUSBAND YOU HELPED ENORMOUSLY, has just phoned, the four of them have just spent a lovely holiday in Spain.
R R Isle of Man

I sent in my FIRST entry last week and won 2nd and 3rd dividends, as you will see from the enclosed certificate. One more and I would have collected over £400 for FIRST dividend. Once I've won a fair amount I shall be staking from winnings and at 2p per line, 4 FIRST DIVIDEND last week at this would have been over £3,000
C.A , Yorks

I am very interested indeed and enclose £20 herewith. I agree to pay you the balance of £55 **ONLY** if I win at least THREE FIRST TREBLE CHANCE DIVIDENDS in my first 20 weeks of entering – otherwise I owe you NOTHING FURTHER at any time – no matter how much money I win. My Signature below is my Undertaking to retain complete and absolute confidence about the method

Name ____________________

Address ____________________

____

Signature ____________________ HCW4

The Managing Director,
Football Enterprises,
'Aneen',
8 New Road,
Haverfordwest, Pembs

Please tick if cassette is for:
Sinclair ZX81 (16K) ☐
Sinclair Spectrum (48K) ☐
Any other Computer ☐

Program encounters of the Forth kind

Jupiter Cantab is so sure that Forth beats BASIC that it made a computer, the Jupiter Ace, and a range of software, specially for it. But can it make its mark in a world of Basic programs? Steven Vickers talked to Candice Goodwin about the case for Forth

These days, anyone who launches a home computer that, like the Jupiter Ace, has a black and white display and doesn't use BASIC has to be either very out of touch with the micro market, or pretty sure of what they're doing.

You couldn't really accuse Jupiter Cantab's founders of being out of touch. Both Steven Vickers and Richard Altwasser worked for Sinclair, and Steven wrote most of the firmware (ROM—based software) for the Spectrum.

Despite the fact that both the ZX81 and the Spectrum turned out to be market leaders, Steven and Richard weren't satisfied with working for Sinclair. "We felt that running computer companies should be in the hands of engineers, not entrepreneurs", said Steven.

One of their major grouses was the programming language, BASIC, used by both the ZX machines and all the other popular home micros. Steven says of BASIC, "it's not the language that beginners should start on, you can't write long programs on it easily".

When they came across Forth, Richard and Steven felt they'd found the answer. "It had enough structure for long programs and it ran very quickly. We saw it as a way of setting people free from the bonds BASIC imposes on them."

Forth was first developed in 1971 by an American, Charles Moore, who wanted a language that would control radio telescopes easily. He really wanted to call the language Fourth, for fourth-generation language, but he was working on an IBM computer which only allowed him five letters for a file name.

Forth programming is based around the concept of a series of words, each word defining an action to be carried out by the computer. You start off with a series of the words already built into the computer — the equivalent of the puter — the equivalent of the GOTOs, PRINTs and so on in BASIC — and then define new words in terms of a sequence of old ones. Each word, then, is roughly equivalent to a subroutine.

Forth runs faster than BASIC because after the program has been written, each of the key words is converted to a two-byte address, ready for the computer to execute immediately. In BASIC, however, the computer has to do most of the conversion while the program is actually running.

Steven and Richard decided that the best way to give Forth to a wider audience was to design a computer specially for it. Richard had been putting components together for a while, and he had a working prototype by the end of 1981.

But because they were both busy putting the final touches to the Spectrum, they didn't make the break with Sinclair until spring 1982.

Their base was Richard's house in Bar Hill, just outside Cambridge, where they worked first in an upstairs room and then, when Richard's son was born and the room was turned into his nursery, in the garage. "Richard's wife gave birth at practically the same time as the computer was born", Steven recalls.

The aim was to have the final version of the Jupiter Ace ready by September 1982. By working 12 hours a day, they did it. But at the same time of the launch, there wasn't much software for the new machine.

The need to write some software forced Richard and Steven to look more carefully at who would be using the Ace. They started off with a general idea that it would be "a machine that would more structured and powerful programs." So they didn't add refinements like a colour display and a full typewriter keyboard. But Steven now feels that "we haven't directed our efforts precisely enough."

Top confuse the issue, the Ace's first collection of programs included a number of arcade-type game. But Steven says, "we shouldn't be pushing it in the games market. I find computer games addictive, but not in a good sense. By the end of the game, I wish I hadn't bothered. It's time computers did something useful."

So now Jupiter Cantab is concentrating on programs for the educational and business market. They've already had orders from research labs, universities and polytechnics, and from several schools who are using it to control equipment like the Cyber robot from Cyber Robotics. But the company's now working on some maths and physics programs to boost the Ace's educational appeal.

As for the business market... could the Ace, with its small rubbery keys and its low profile, really catch on? Steven admits that they are "working on the case to make it more acceptable to business", and a deluxe model can be expected in a few months' time. But he maintains that "the possible applications for things like spreadsheets are quite powerful."

Jupiter Cantab now has a new base and a slightly different line up. It recently moved from Richard's house into Cambridge itself, to 100-year-old premises in Cheshunt Building, Bateman Street. Richard has now resigned as a director, in order to spend more time with his family, and his brother Steven has replaced him on the board. There's also a marketing director, Geoffrey Walker.

The ace itself is selling steadily, and Jupiter Cantab's commitment to it is evident in plans to bring out products to support it — a 16K RAMpack has already appeared, and a printer interface is due out in a few months.

But for Jupiter, the Ace isn't just any old computer. As Geoffrey Walker put it, "Forth programming is liberating. It's what you really wanted to do with a microcomputer."

Or as Steven Vickers said, "Comparing Forth to BASIC is like comparing a Gothic cathedral to a mud hut."

Steven Vickers and Richard Altwasser: two for Forth

Take a tip from us

Poking around in your VIC-20

While experimenting with my VIC 20, I have found some useful SYStem commands and POKEs The SYStem command in particular is a great way of bugging your programs for unsuspecting victims

If you type SYS 64802 into a VIC, this returns the screen back to its original format of CBM BASIC V2 BYTES FREE It also NEWs any program in the memory It is infuriating to type in a long program and run it only to find nothing there, so it is a good idea to save any program beforehand

The trick can be used in a program, like so

```
?"ANOTHER GO " INPUT A$
  IF A$ = "Y" THEN SYS64802
  IF A$ = <>"N" THEN RUN (very infuriating!)
```

The next is a POKE if you POKE 37154, 0, this simply turns the keyboard off! But if you have a joystick, you can get the numbers 6,8 and 0, and the $ sign, and get the CLR HOME key to work, by pushing the joystick to the left

If you POKE 650,225 you get auto repeat on all the keys, making DATA programming and the inverse characters easier to handle

Finally, typing SYS 2345 will clear the screen and print READY, provided that there is no program in memory If there is a program, it will immediately crash, and the VIC will have to be turned off to regain use of the keyboard

Christopher Atkinson

Your lines renumbered VIC-20

Basic programs are stored in the VIC from a byte pointed to by locations 43 and 44 Each line of program is stored as a block in line order but, as lines are of varying length, they occupy varying numbers of bytes

Fortunately, preceding each block of bytes are two bytes holding the address of the beginning of the next block, the Link Address Following the Link Address, two more bytes contain the Line Number

Using the information from the first four bytes of the block you can renumber a program using a short Basic routine

Unfortunately it is too complicated to renumber program jumps (GOTO & GOSUB) using Basic You could do it using machine code But my short, 10-line Basic program can be easily typed in whenever it is needed A machine code routine, on the other hand, would best be loaded before any programming takes place

I have written the routine using the ten highest permissible line numbers as it is unlikely that you will be using them in your program It will work on any size of memory and will use any size step, requested at the start

```
63990 INPUT"STEP",Z
63991 LL=PEEK(43)+PEEK(44)*256:Y1=0:Y2=0
63992 X1=PEEK(LL):X2=PEEK(LL+1):Y1=Y1+Z
63993 IFY1=<255THEN63995
63994 Y2=Y2+1:Y1=Y1-256
63995 IFPEEK(LL+2)+PEEK(LL+3)*256=>63989THEN63999
63996 POKELL+2,Y1:POKELL+3,Y2
63997 LL=X1+X2*256
63998 GOTO63992
63999 LIST-63989
```

The routine notes the contents of the Link Address before replacing the next two bytes with the new line number As one byte cannot hold more than 255, each time the contents exceed that, one is added to the 'high' byte, the 'low' byte starts again from 0 plus any remainder

The program also checks to see if it has reached the line number before the routine begins It would not be helpful to renumber the routine itself while it is running!

Finally it uses the information read at the beginning to calculate the address of the start of the next block of program and then jumps to it

When the routine reaches the last line of the program to be renumbered it LISTS the program

As the GOSUB and GOTO statements have to be renumbered by hand it is a good idea to mark them using a REM statement so that you can find them once they have been renumbered, like so

Old numbering

```
10 GOSUB 126
•
•
•
•
126 PRINT "Beginning of subroutine" REM 126
```

```
10 GOSUB 126
(To be changed to 250)
•
•
•
•
250 PRINT "Beginning of subroutine" REM 126
```

You will then be able to change the number in the GOSUB statement and delete the REM To run the routine just type RUN63990 and wait The delay will depend on the length of your program but will certainly be quicker than retyping it

Don't forget to END your program before the subroutine to keep it separate, and to delete it before storing your final version

Remember that the subroutine requires memory space too, so can't be used if your program is near the limit of memory

Clive Adams

A load off your mind Oric-1

A number of Oric owners have told me that they find it impossible to load from cassette at the high baud rate — 2400 baud — but have no trouble with the slow rate

I too had this problem, and as I found no guidance in the Oric manual, carried out some timing tests I found fractional differences between the first program on a tape and subsequent SAVEs of the same program

From this I concluded that the first few bytes of a fast load program were being lost on the tape leader, which was made of plain tape

There are two solutions to this problem Firstly turn the tape up to the end of the leader before loading Secondly, if the cassette is held together with screws, open it up, then disconnect and cut off the leader, refitting the end of the tape to the spool centre Then repeat the process for the other end of the tape

I recommend the second solution, because it's very easy to save a program in a hurry, only to find later on that it won't run because you forgot to wind the tape on There are leaderless tapes on the market — for telephone answering machines, for example — but they tend to be expensive

Ian Collins

Fill in with your Oric-1

The problem with the colour attributes on the Oric is that they are serial, causing everything on the right of that row to have the same colour until it meets another attribute

My tip helps you overcome this by filling the screen with a certain attribute This means that when a new attribute is added, it does not cause the whole row to change colour

The following program exploits this ability It fills the screen with different sized rectangles in different colours, demonstrating the speed and flexibility of the Fill command

Larger rectangles can be obtained by changing the numbers in lines 50 and 60, but take care not to exceed the screen size Line 40 is needed because of the properties of the attribute

```
10 PAPER 0 INK 7
20 HIRES
30 PRINT CHR$(17) REM REMOVES THE FLASHING CURSOR
40 CURSET 0,03. FILL 200,40,16 REM INITIALLY FILL SCREEN WITH BLACK BACKGROUND
50 CURSET INT(RND(1)*200), INT(RND(1)*180),3
D(1)*180),3
60 FILL 10+ INT(RND(1)*11), 3 + INT(RND(1)*2), 17 + INT(RND(1)*7)
70 GOTO 50
```

H.S. Lim ■

sinclair special

1

Inside...
Latest prices round-up...
Latest software...
Order form...

Introduction

One thing's certain about the Sinclair world – there's never a dull moment.

Every month sees new software and new hardware, produced by Sinclair enthusiasts, or produced by Sinclair itself.

The magazines do a fantastic job of keeping you up to date with the input of enthusiasts. We want to keep you in touch with Sinclair's own developments.

Every month, there'll be a Sinclair Special in this magazine.

Sometimes, inevitably, there won't be anything new to say – we want to break away from the breathless announcements of hardware and software you just can't buy.

But when something new is available, we want you to have accurate information – fast. You'll find it here.

This month, we're giving you the latest information on the recommended retail prices of Sinclair equipment. They're our prices, and you may well find things cheaper (or dearer) in the shops. If they're cheaper – terrific! Snap them up. Note, however, that from us the ZX81 is down to £39.95.

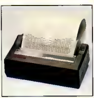
We're also announcing six superb new Sinclair cassettes for the Spectrum, and three more which make full use of the ZX81. There's an order form at the back of this Special.

Next month ... but there, next month is another story! Watch (as they say) this space.

Nigel Searle

Nigel Searle
Managing Director
Sinclair Research Ltd

Spectrum – latest recommended retail prices.



16K was £125.00
16K now £99.95

48K was £175.00
48K now £129.95

ZX Printer was £59.95 *ZX Printer now £39.95*
ZX81 was £49.95 *ZX81 now £39.95*

sinclair ZX Spectrum
SMALL BUSINESS ACCOUNTS
sinclair ZX Spectrum
FORTH
sinclair ZX Spectrum
SCRABBLE
PSION
sinclair ZX Spectrum
CYRUS IS CHESS
CASSETTE 16K 48K RAM
sinclair
HORACE & THE SPIDERS
sinclair ZX Spectrum
BACKGAMMON
PSION

Six new ways to make more of your Spectrum.

Take a look at these brand new titles Each is an outstanding new program using the full potential of the Spectrum, for games with stunningly animated graphics, for strategies of fiendish cunning for masterly applications of computing capability

Cyrus-IS-Chess Based on the Cyrus Program which won the 2nd European Microcomputer Chess Championship *and* trounced the previously unbeaten Cray Blitz machine With 8 playing levels cursor piece movement replay and take-back facilities plus two player option The 48K version has many additional features including an extensive library of chess openings For 16K or 48K RAM Spectrum

Horace and the Spiders Make your way with Horace to the House of Spiders armed only with a limited supply of anti-spider-bite serum In the house, destroy the webs before the spiders can repair them Then destroy the spiders, before *they* destroy Horace! Undoubtedly the creepiest Horace program ever produced! For 16K or 48K RAM Spectrum

Computer Scrabble The famous board game, on screen – with the whole board on view! A huge vocabulary of over 11,000 words Full-size letter tiles four skill levels – the highest of which is virtually unbeatable For 1 to 4 players For 48K RAM Spectrum
(SCRABBLE trademark and copyright licensed by Scrabble Schutzrechte und Handels GmbH – a J.W. Spear and Sons PLC subsidiary)

Backgammon A fast, exciting program with traditional board display, rolling dice and doubling cube Four skill levels For experts – or beginners (Rules are included – it's the quickest way to learn the game) For 16K or 48K RAM Spectrum

FORTH Learn a new programming language as simple as BASIC but with the speed of machine code Complete with Editor and User manual For 48K RAM Spectrum

Small Business Accounts Speeds and simplifies accounting work, produces Balance Sheets, Profit and Loss information *and* VAT returns Complete with User manual For 48K RAM Spectrum

Overleaf–your Sinclair order form.

Three new ways to get the best out of your ZX81.

The range of Sinclair software for the ZX81 continues to grow

These three new cassettes offer two totally different challenges to you and your ZX81 The games – like so many ZX81 games today – really do use the ZX81's capability The FORTH program is a fascinating extension of your own computer understanding

Sabotage Defender or attacker? The choice is yours in this exciting game

Be the Guard and defend the randomly placed boxes of ammunition inside the compound – or be the Sabateur and attack the ammunition!

Written by Macronics for a ZX81 with 16K RAM Cassette price £4 95

City Patrol You are the Commander of a laser firing ship Your task is to intercept and destroy alien suicide ships descending on your city Judge your rating as Commander by how many aliens you destroy and how much of your city survives

Written by Macronics for a ZX81 with 16K RAM Cassette price £4 95

FORTH Discover a new programming language which combines the simplicity of BASIC with the speed of machine code

FORTH's compiled code occupies less than a quarter of the equivalent BASIC program and runs ten times as fast. It is fully extendable by the addition of user-defined commands

Free User Manual and Editor Manual with each cassette

Written by Artic for a ZX81 with 16K RAM Cassette price £14 95

sinclair
CITY PATROL
sinclair
ZX81
SABOTAGE
sinclair
FORTH
16K RAM

How to order

Simply fill in the relevant section(s) on the order form below Note that there is no postage or packing payable on Section B Please allow 28 days for delivery Orders may be sent FREEPOST (no stamp required) Credit-card holders may order by phone, calling 01-200 0200 24 hours a day 14-day money-back option

sinclair

Sinclair Research Ltd,
Stanhope Road, Camberley,
Surrey, GU15 3PS
Telephone. (0276) 685311.

To Sinclair Research Ltd, FREEPOST, Camberley, Surrey, GU15 3BR.

ORDER FORM

Section A hardware purchase

Qty	Item	Code	Item Price £	Total £
	ZX Spectrum – 48K	3000	129 95	
	ZX Spectrum – 16K	3002	99 95	
	ZX 81 (including 1 2A Mains Adaptor)	1003	39 95	
	16K RAM pack for ZX81	1010	29 95	
	ZX Printer	1014	39 95	
	1 2A Mains Adaptor for use with ZX81 computer/ZX Printer combination (only required if you have an early ZX81 with 0 7A Adapter)	1002	7 95	
	Printer paper (pack of 5 rolls)	1008	11 95	
	Postage and packing orders under £90	0028	2 95	
	orders over £90	0029	4 95	
			TOTAL £	

Section B software purchase

Qty	Cassette	Code	Item Price £	Total £
	FOR SPECTRUM			
	G22/S Backgammon	4021	5 95	
	G23/S Cyrus-IS-Chess	4023	9 95	
	G24/S Horace & the Spiders	4022	5 95	
	G25/S Scrabble	4024	15 95	
	L1 /S FORTH	4400	14 95	
	B6 /S Small Business Accounts	4605	12 95	
	FOR ZX81			
	G25 Sabotage	2124	4 95	
	G24 City Patrol	2123	4 95	
	L1 FORTH	2400	14 95	
			TOTAL £	

*I enclose a cheque/postal order made payable to Sinclair Research Ltd for £________

*Please charge to my Access/Barclaycard/Trustcard account no

*Delete/complete as applicable (Please print)

Signature Mr/Mrs/Miss

Address

HCW607

Old wine in new bottles

Some traditional games convert well to computers — others don't. Find out which . . .

Monopole Commodore 64 £5.99

Rabbit, 380 Station Road, Harrow, Middlesex HA1 2DE

One of the advantages of a large amount of memory is that very long programs can be used to give greater detail to games. This package, an implementation of the classic Monopoly, is such a game, and a very impressive one.

Every feature of the popular board game is reproduced in a colourful and imaginative version which takes all the strain, but none of the enjoyment out of playing.

Complete records of all Title Deeds are available for recall, and a list of options for buying, selling, mortgaging and building is provided. The board itself is a complete Monopoly board drawn out on the screen in full colour, with dice thrown, counters moved and cards taken automatically.

Sound and graphics are used splendidly, with realistically whistling trains at stations and an alarming police siren which heralds your incarceration in jail!

Even optional rules such as the Auction rule and Free Parking Jackpot are catered for. The only way to realise how complete the game is must be in playing. Unfortunately only two players can play at a time.

Although writen in BASIC, the game does not suffer from lack of speed, and the imaginative graphics and sound make for an extremely enjoyable play. In my opinion this is a must for all 64 owners, and will surely convert many newcomers into Monopoly addicts!

D.A.

instructions	80%
playability	90%
graphics	85%
value for money	95%

★ ★ ★ ★ ★

3D Quadracube Spectrum £4.95

Artic, 396 James Reckitt Ave., Hull, N Humberside HU8 0JA

3 D Quadracube is described by Artic as a new version of 3D Tic Tac Toe or Connect Four.

The screen shows a large 3D cube composed of 64 smaller cubes. You and your opponent (either the Spectrum or another player) take turns at nominating a small cube in your own colour with the object of making a continuous row, column or diagonal of four.

The large cube is sliced into four sections for clarity and the game is easy to play (though not so easy to beat the Spectrum).

A pleasant and challenging game of strategy.

D.J.

instructions	75%
playability	75%
graphics	70%
value for money	70%

★ ★ ★

Othello Jupiter Ace + 16K £7.95

Jupiter Cantab, Bateman Street, Cambridge CB2 1LZ

A Forth version of this popular game played on a rather small eight by eight matrix, against either the computer or a fellow human.

Very user-friendly, the program lets you make silly moves without crashing and teaches you the rules by trial and error, if you found the rules on the cassette card less than adequate.

You always play white against the computer's black, and you will find it a really tough opponent.

There's no special advantage in playing the game on a Forth machine, as speed hardly enters into it, and fancy displays would just be a distraction.

Playing for long on the small display, however, does tend to result in eyestrain. A larger copy of the same board would be a big improvement.

G.M.

instructions	75%
playability	80%
graphics	60%
value for money	65%

★ ★ ★ ★

Decathlon TI-99/4A £7

Pewterware, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

Decathlon features ten Olympic events including, amongst others, 100 metres sprint, long jump, 100 metre hurdles and pole vault. One to eight players take part.

For each of the ten events the players attempt to press a key at a precise time following a tone — one second for event number one up to ten seconds for event number ten. The closer the key press is to the correct time, the higher the points scored.

Some of the events, long jump, shot putt, discus and jump, shot put, discus and javelin, are on a best of three attempts basis. A simple graphical display is given showing your performance in each event.

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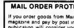

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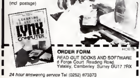

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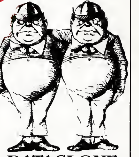

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